

# SfB (2)

This issue of the AJ should be filed as it contains part of a 50-part technical information library which the AJ is founding. Below are the most important elements from Table 1 of the SfB classification.

These are the key to our library production programme, and each week we shall publish, with the normal AJ, a supplement dealing with one of these elements. Headings in bold type are those dealt with in previous issues. This week's supplement covers SfB (2). The remaining headings will be published in subsequent issues. This is a token preclassified file cover for the Element File Technical Studies, Element Design Guide and Information Sheets within, and for all subsequent articles and digests on these subjects which an architect needs to keep. At the end of a year readers will have a design manual covering all the functional elements listed below and forming the nucleus of a technical library.

- (11) **Ground: General**
- (12) **Drainage: General**
- (13) **Retaining structures**
- (14) **Roads and pavings: General**
- (15) **Garden: General**
- (15) **Garden: Fences, gates, walls**
- (16)-(19) **Foundations**
- (53) Installations, water, hot and cold: General
- (54) Installations, gas, compressed air, steam, refrigeration: General
- (56) Installations, heating: General
- (56) Installations, heating: Equipment and fuel
- (57) Installations, ventilation, air-conditioning: General
- (63) Installations, electrical: Lighting and power: General
- (63) Installations, electrical: Lighting equipment
- (64) Installations, communications: General
- (66) Installations, mechanical: General
- (68) Installations, special: General
- (72) Rooms, fixtures and equipment: General (fixed furniture)
- (72) Rooms, fixtures and equipment: General (loose furniture)
- (73) Kitchens, fixtures and equipment: General
- (74) Cloakrooms, bathrooms and lavatories, fixtures and equipment: General
- (75) Laundries, fixtures and equipment: General
- (2) **Structures: General**
- (2) Structures: Concrete: General
- (2) Structures: Sections, metal
- (2) Structures: Sections, wood
- (21) Walls: External load-bearing: General
- (21) Walls: External non-loadbearing: General
- (22) Partitions: General
- (23) Floors, ground: General
- (23) Floors, structural: General
- (24) Stairs and ramps: General
- (25) Ceilings, suspended: General
- (26) Roofs, structural, flat: General
- (27) Roofs, structural, pitched: General
- (30) Accessories, ironmongery: General
- (31) Windows: General
- (31) Windows: Sections, metal
- (31) Windows: Sections, wood
- (32) Doors: General
- (34) Handrails and balustrades: General
- (37) Roof-lights and traps, etc.: General
- (38) Roof eaves, verges, gutters, rails: General
- (41) Finishes, external: General
- (42) Finishes, internal: General
- (43) Finishes, floor: General
- (46) Finishes, flat roofs
- (47) Finishes, pitched roofs: General
- (51) Installations, refuse disposal: General
- (52) Installations, drainage and sanitation: General



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02

## 02

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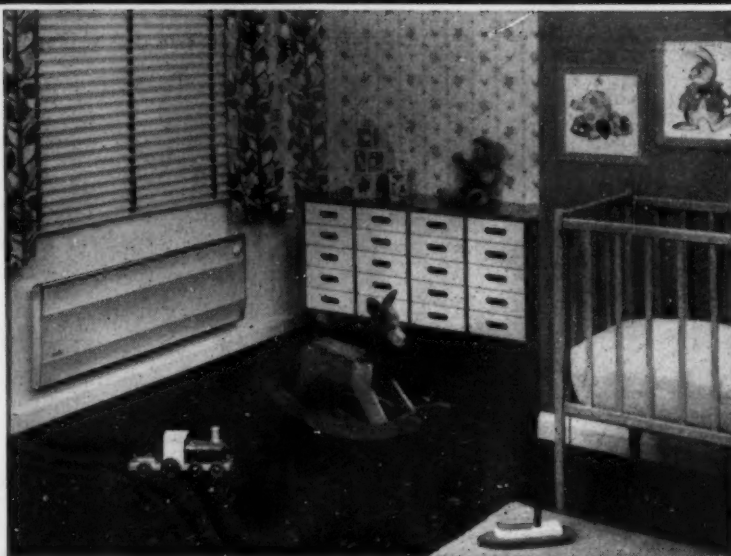
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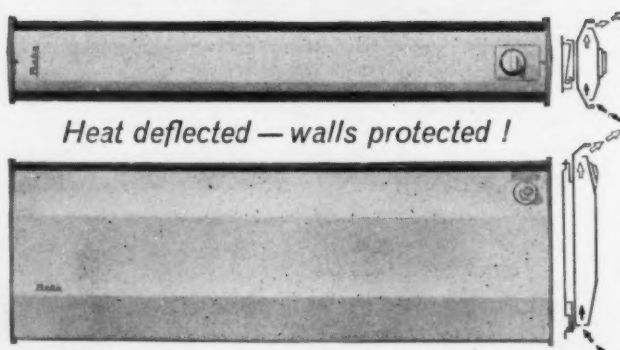
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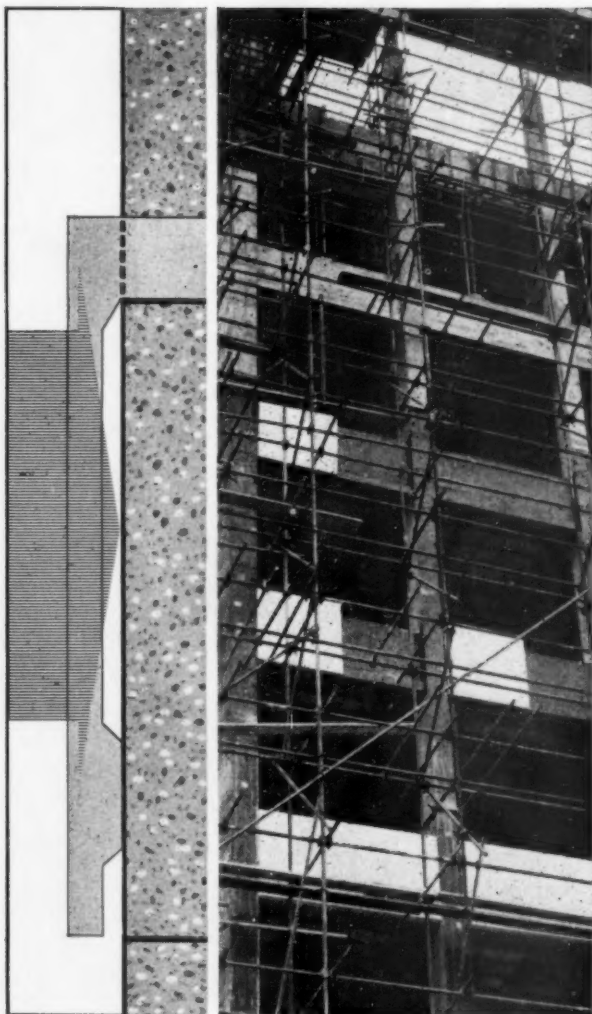
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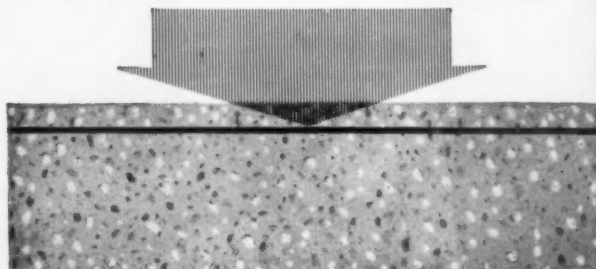
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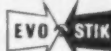
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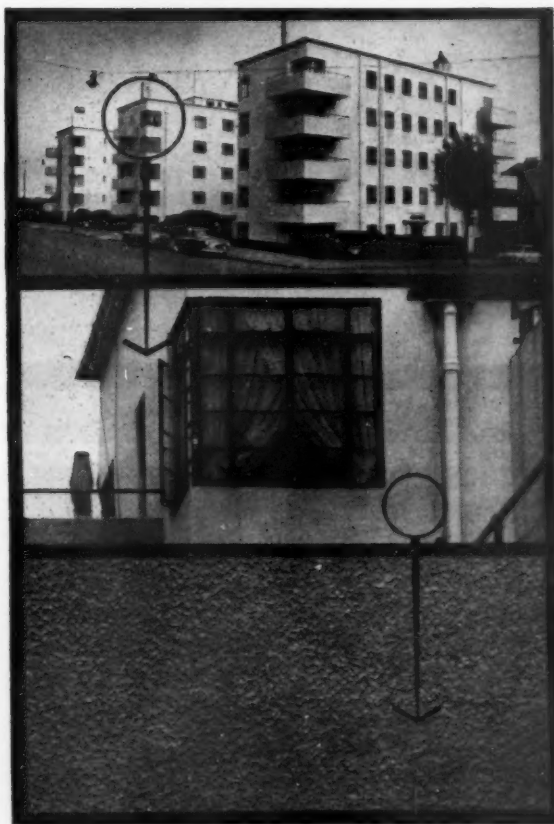
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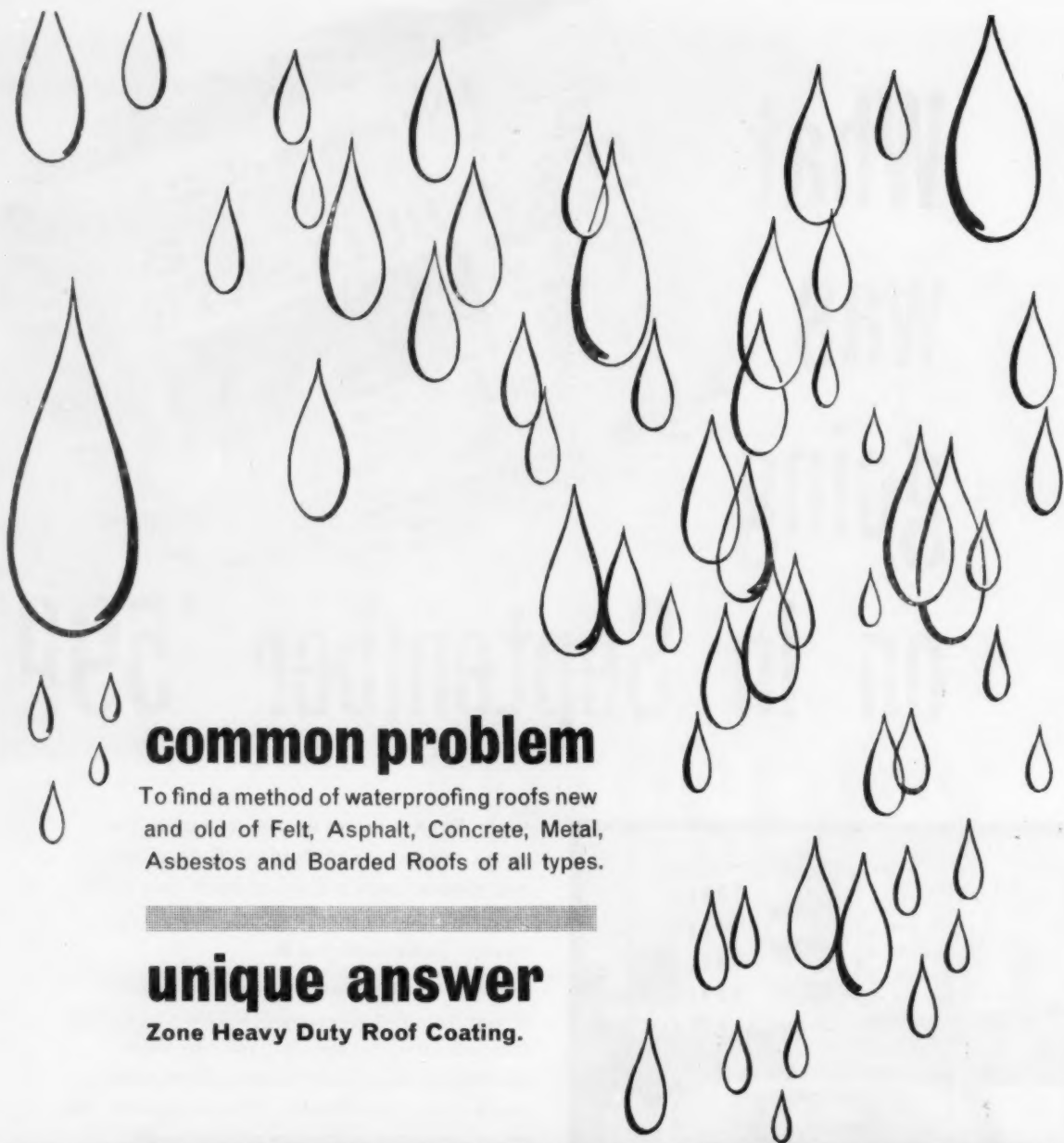
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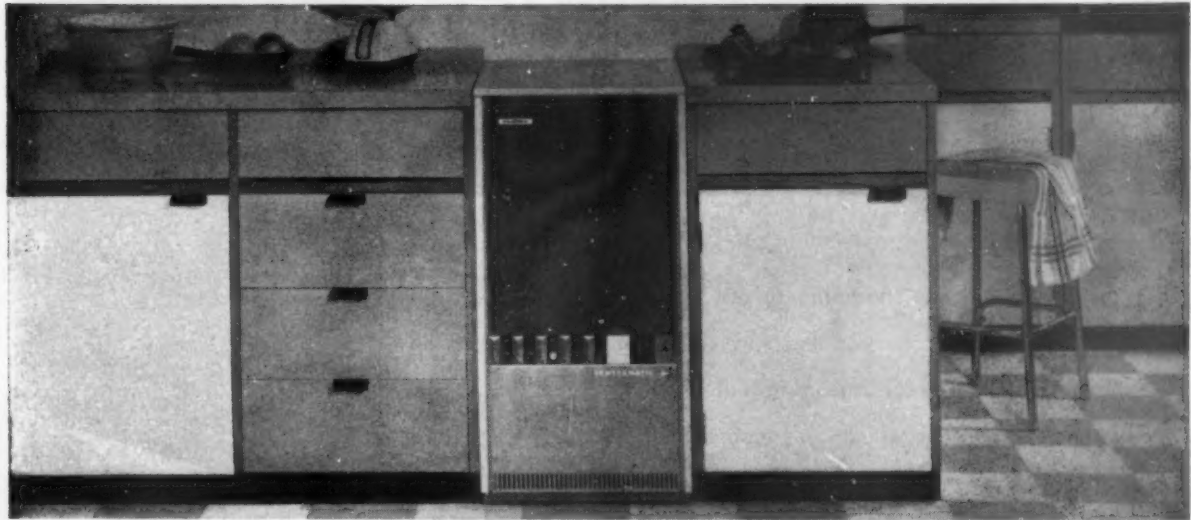
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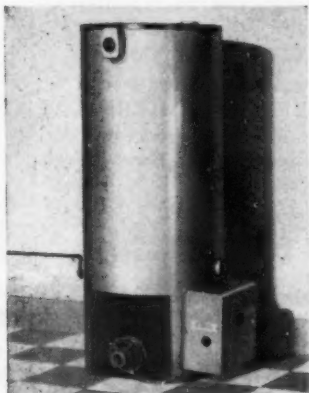
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AJ9/11

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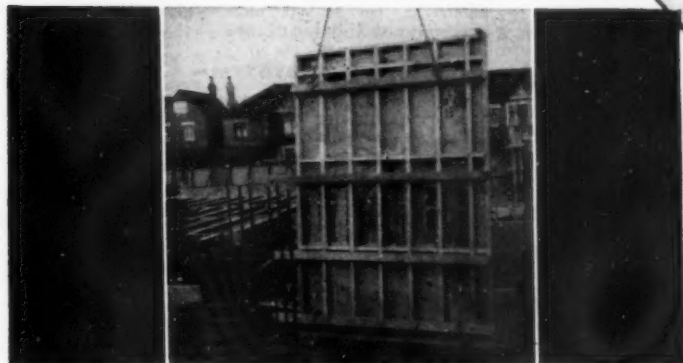
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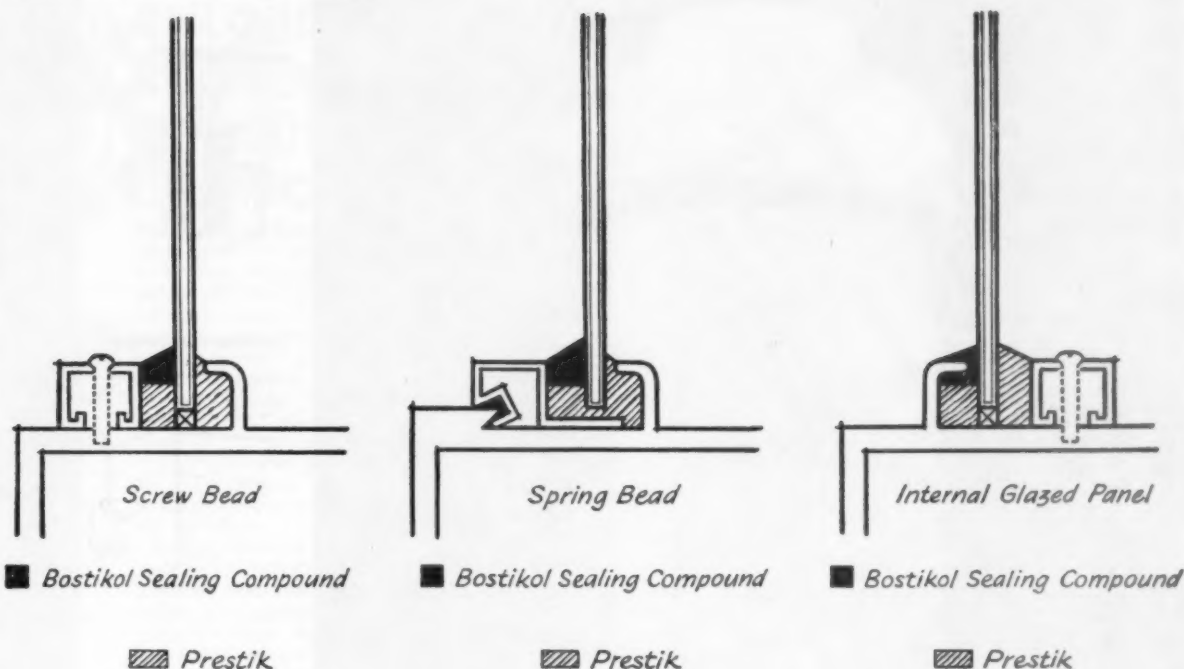
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## NUMBER 1 - GLAZING SEALS



## Finding the right sealing compound

These days it's not easy for the architect or the builder to keep bang up-to-date with the latest improvements. This is especially the case with sealing compounds, where the already large number designed to do specialists' jobs is steadily increasing. That's why 'Bostik', who have just about every sealing compound you require, have prepared these notes on the **four main types** of sealing compound.

**'Prestik' preformed sealing strips** will maintain a flexible seal against years of weathering. They expand and contract with the joint that they're sealing, will not harden, get brittle or shrink. All grades exclude dust, rain and snow: the special grades resist petrol and oil.

**'Bostik' butyl-based mastics** are made from a butyl rubber base which gives permanent elasticity. They have very good ageing and weathering qualities, and strong adhesion to most building materials. Some form a dry tack-free surface in a few hours and a tough resilient seal in a few days, others remain tacky. They will not shrink, crack or slump.

**'Bostik' gun mastic** is based on oils and resins and provides

a good general-purpose, easily applied sealant for joints which will not be subject to large movements.

**'Bostikol' sealing compounds** are based on polysulphide synthetic rubber. Applied in liquid form, they cure in position without shrinking and form a tough, permanent, weathertight seal to resist all arduous conditions met in curtain wall structures. A wide choice of grades provides different physical characteristics to suit different conditions.

*One last word about 'Bostik' research: if you've any problems to do with sealing or bonding building materials, don't hesitate to get in touch with us. It's our job. We may have solved your problem already. And if we haven't, we'll get down to it right away.*

Write to: 'Bostik' Building Advisory Department, B.B. Chemical Co. Ltd, Leicester.

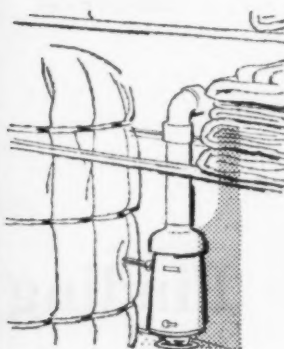
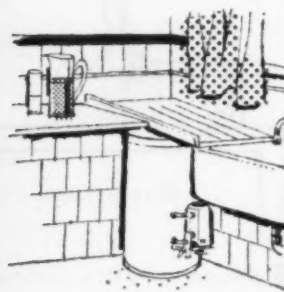
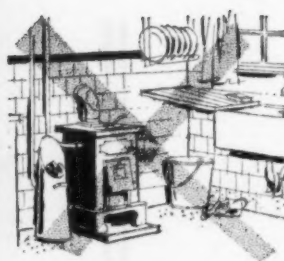
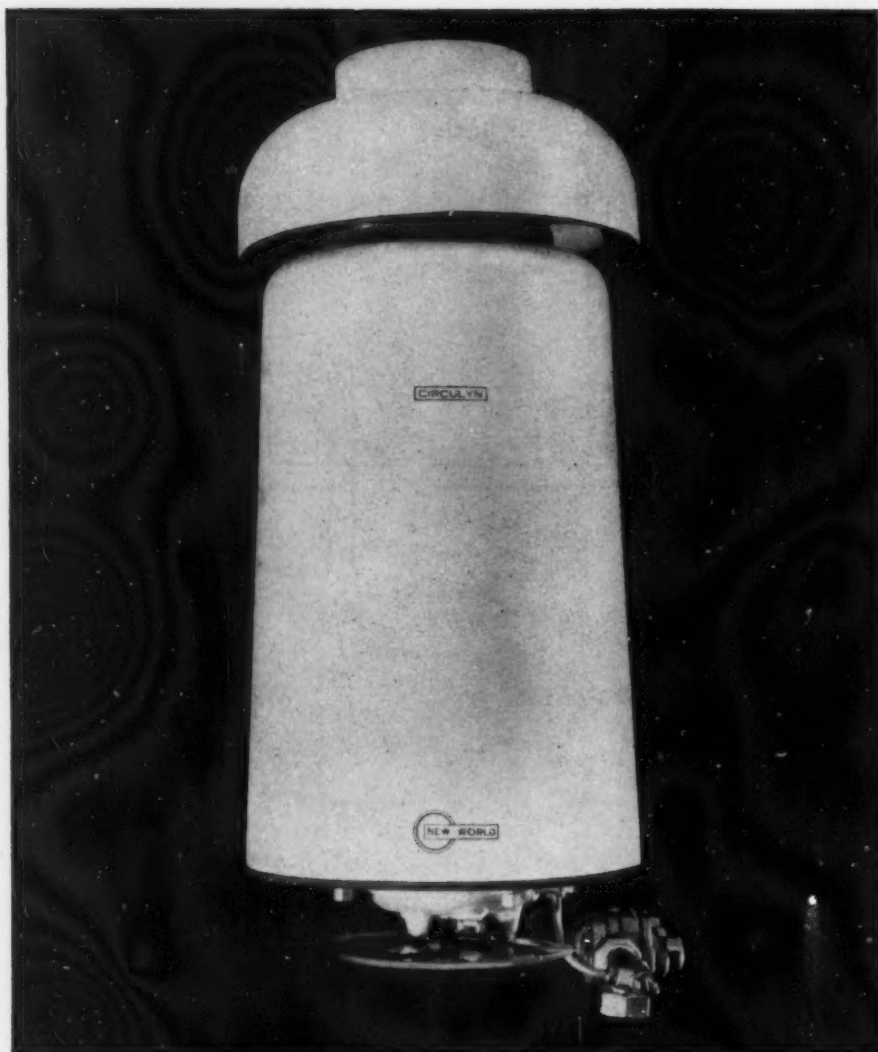
## Bostik

MAN FRIDAY TO THE BUILDING INDUSTRY

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**'Bostik' will be delighted to discuss your problems at the  
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\* When fitted, an economy valve efficiently cuts running costs by allowing the user to heat small or large quantities of water as required.

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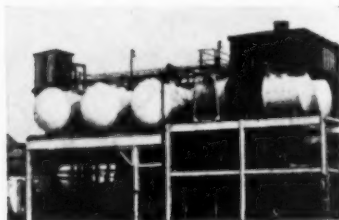
## CHLORINATED RUBBER CONQUERS CHEMICALS

There's a steel tower on an ammonia liquor plant in an I.C.I. factory in North-West England. Built in 1955, it was painted with a high-quality protective paint system based on synthetic resins. By 1956, little more than a year later, the paint had virtually disappeared under the combined attack of ammonia gas and moisture. The painting gang moved in and started afresh. Wire brushing . . . red lead . . . under-coats . . . top-coats—they gave that steelwork the full treatment! But within a few months they were back again, scraping and patching.

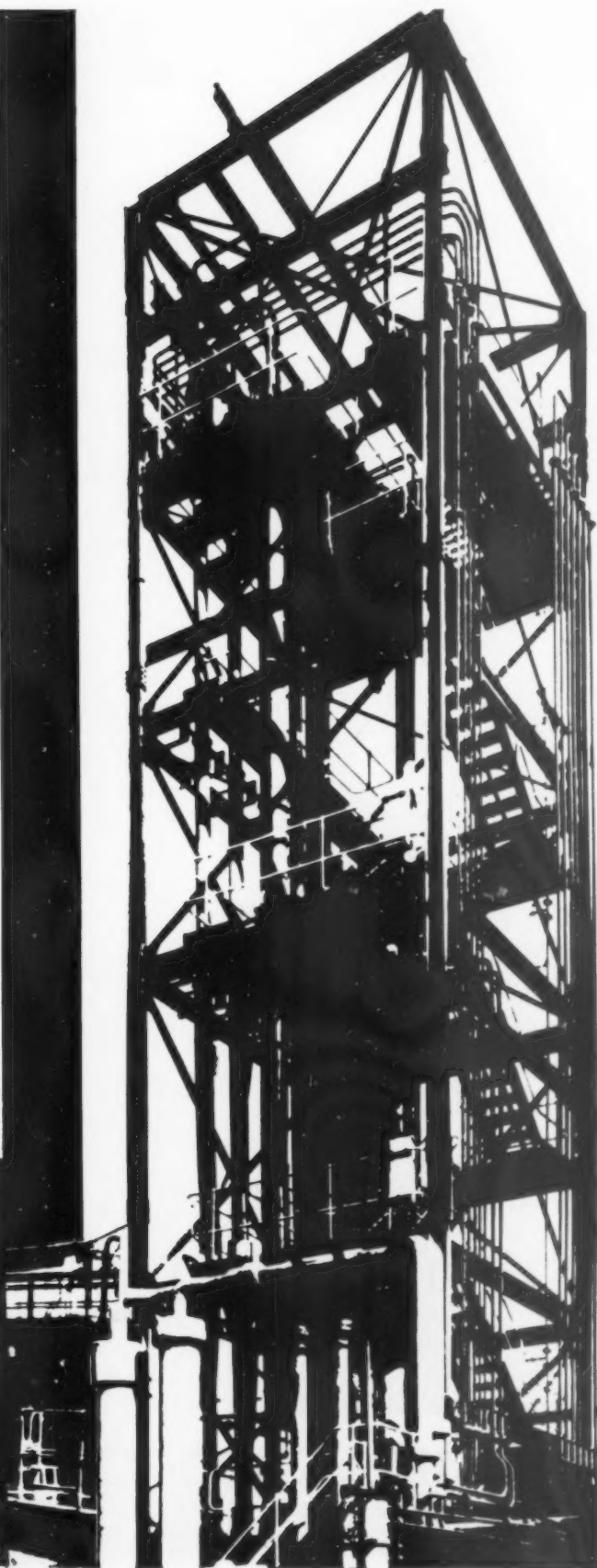
And so it went on until, in 1959, they tried a newly developed thick-coating based on 'Alloprene'—I.C.I. chlorinated rubber. The painters haven't had to touch that tower since—and, to judge from appearances, it will be a long time before anything has to be done.

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*Photograph reproduced by courtesy of 'The Times'*

The New Garret Hostel Bridge, Cambridge, uses hand rails and balustrade of Delta Bronze No. IV.

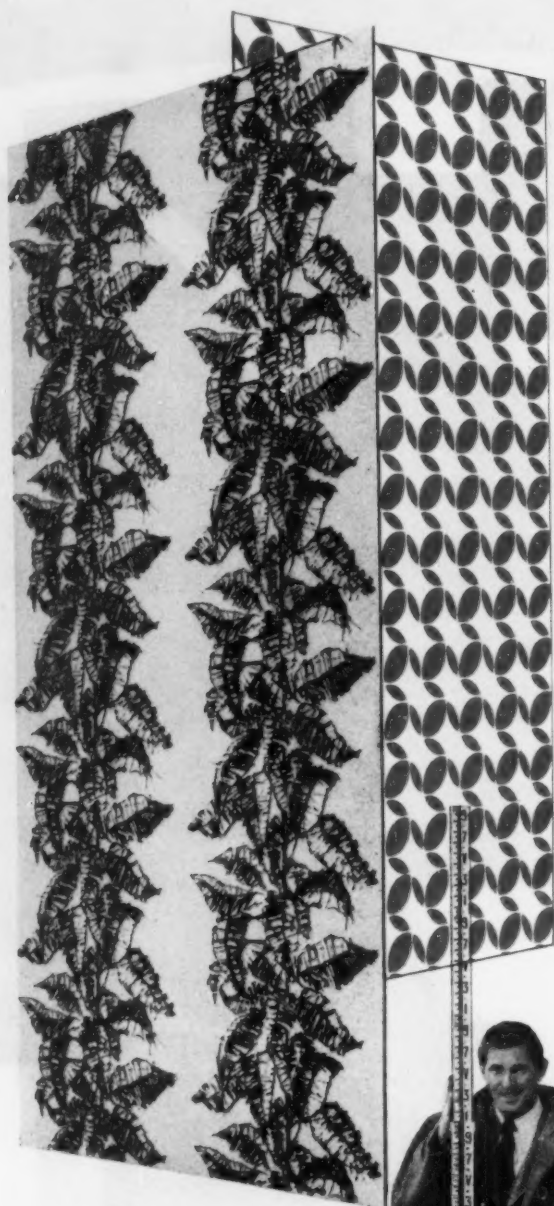
Architects:  
Timothy Guy Morgan in conjunction with Guy Morgan, F.R.I.B.A.

**The Delta Metal Company Limited**

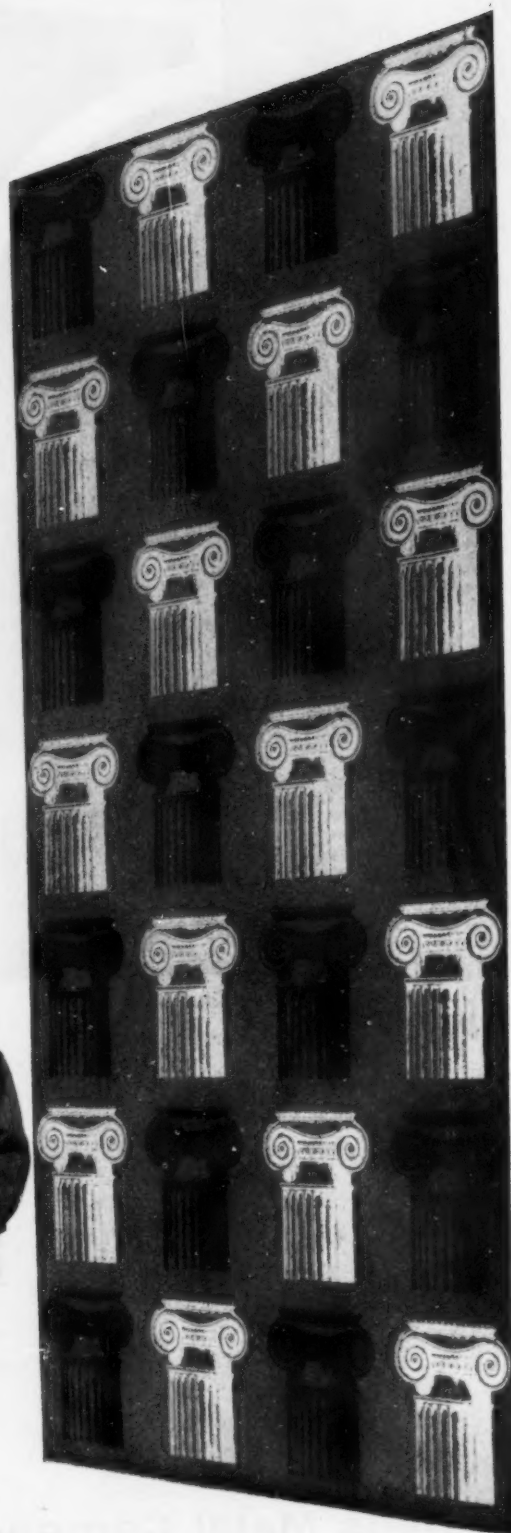
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See the new FORMICA  
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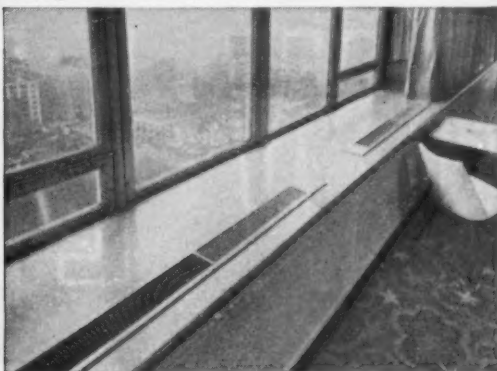
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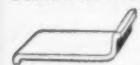
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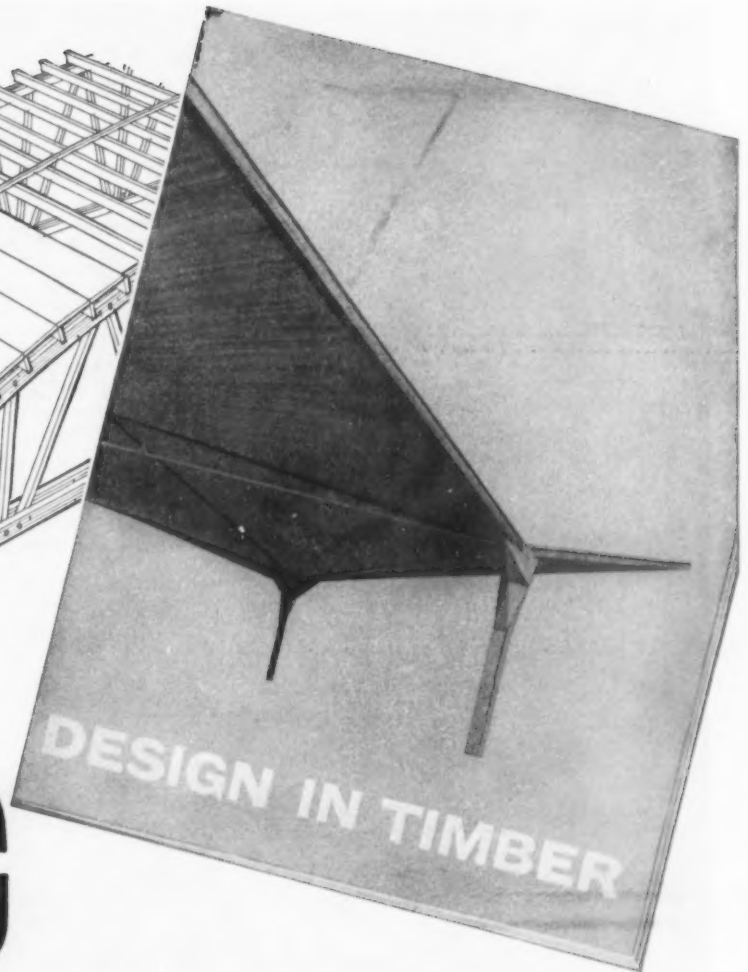
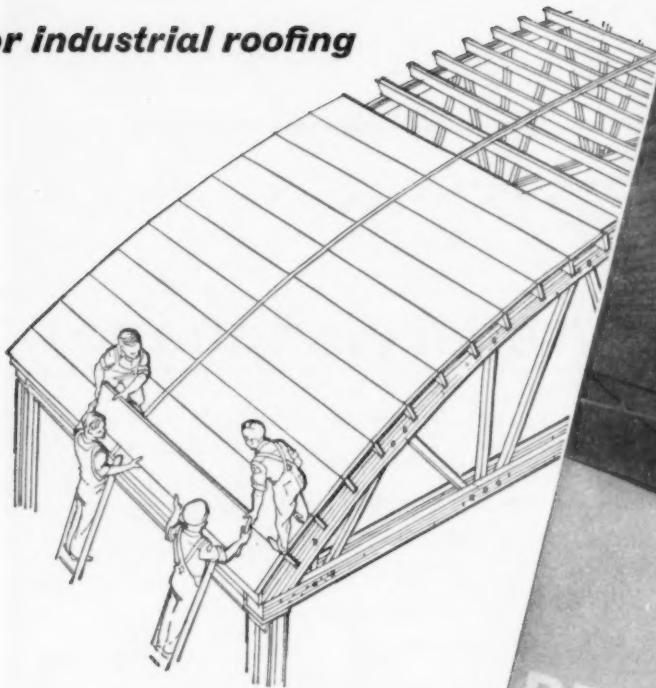
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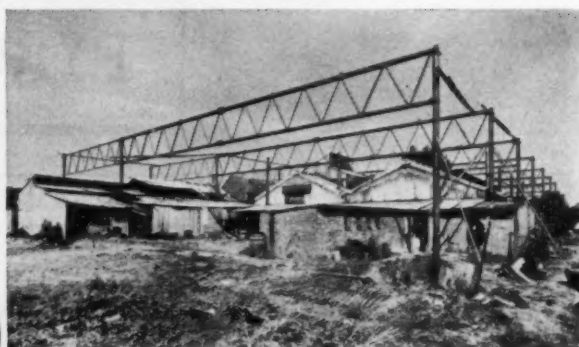
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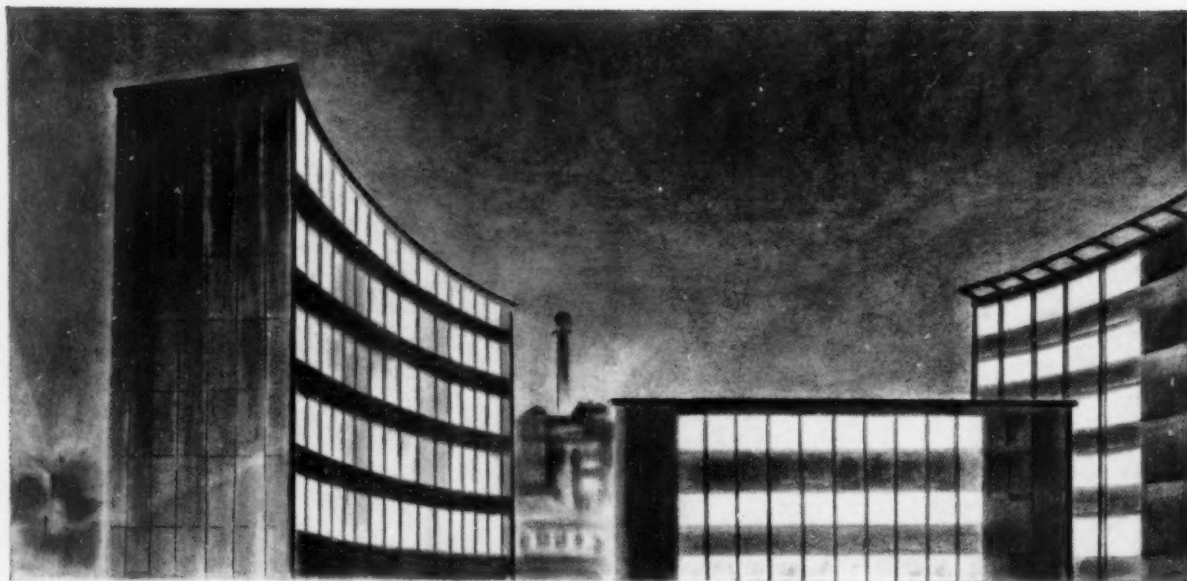
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\* *Reproduction of Hydria of  
Pamphalos depicting Athene, Apollo and  
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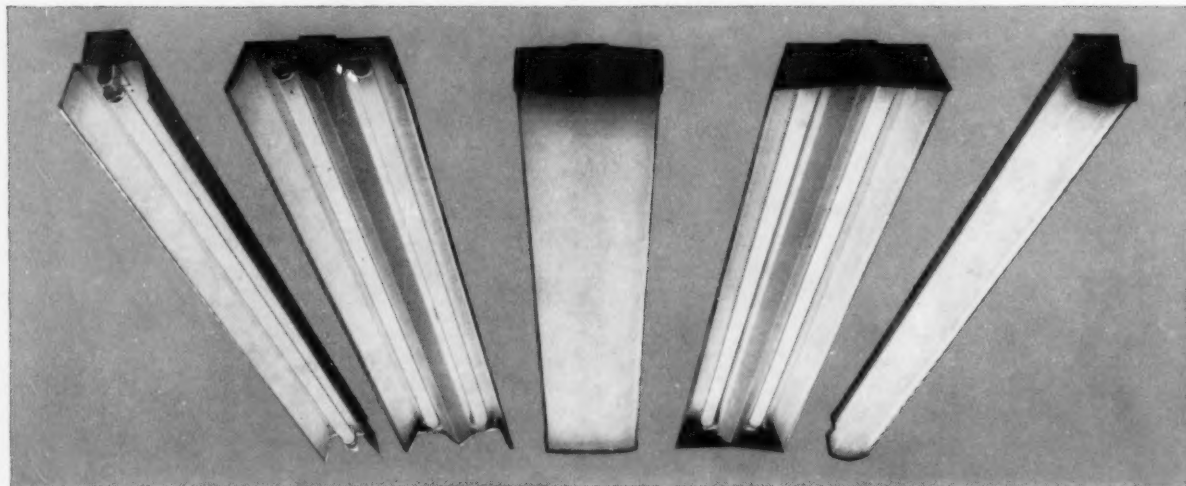
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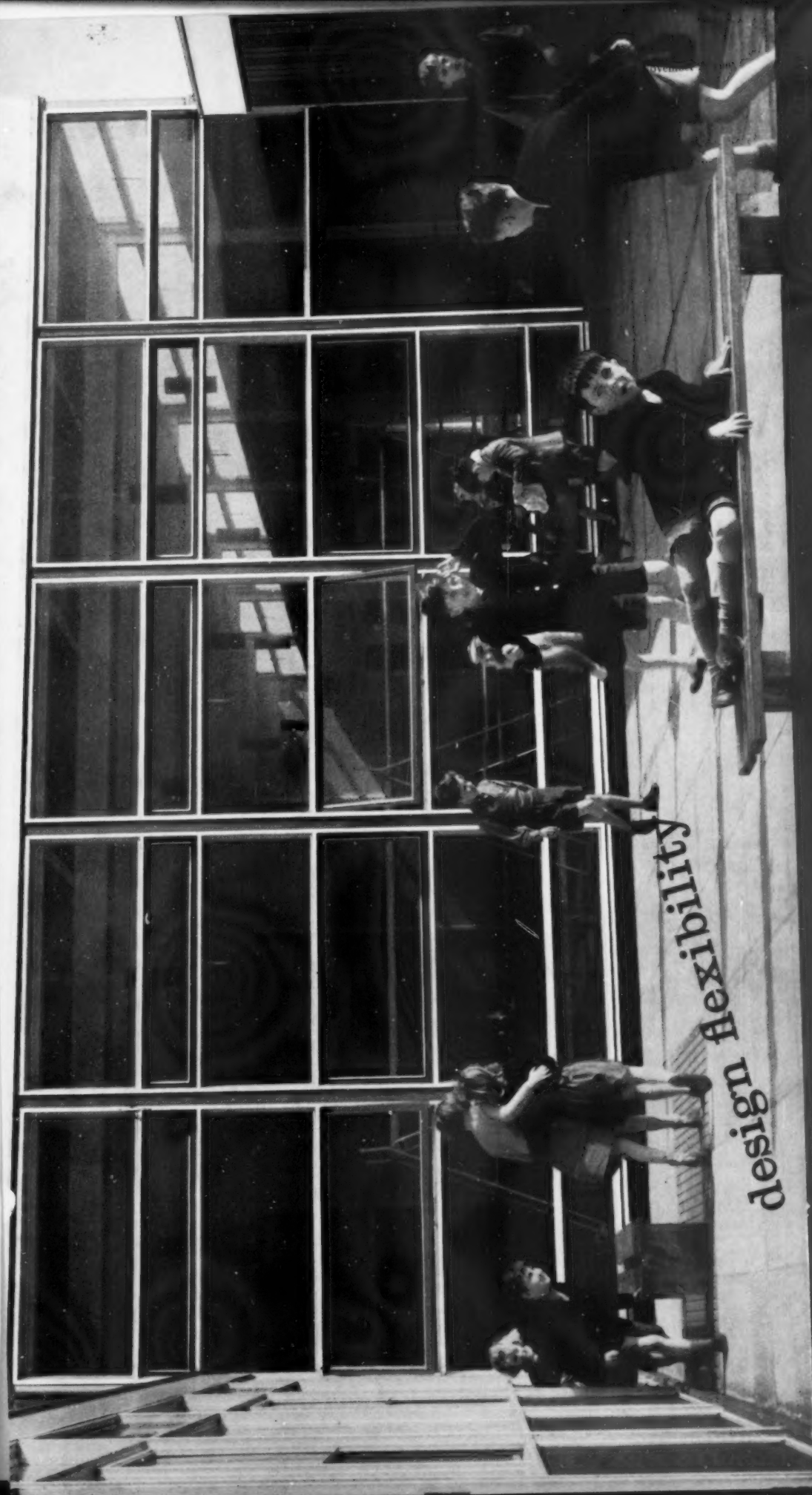
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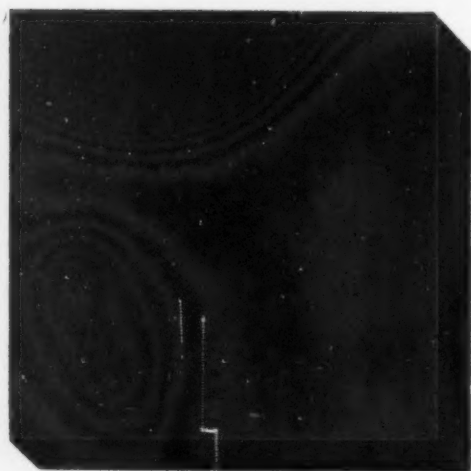
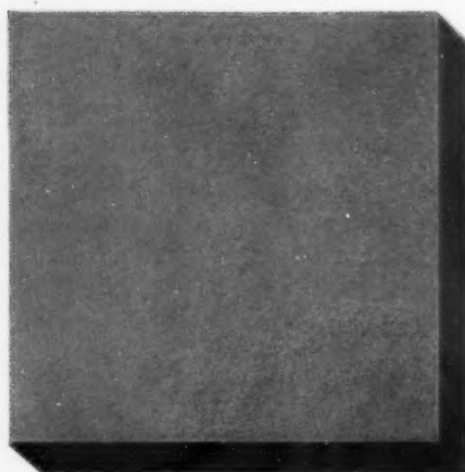
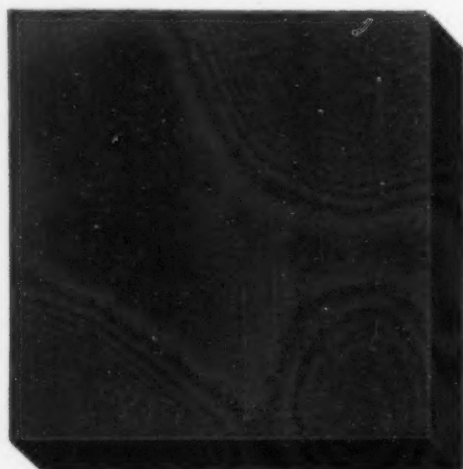


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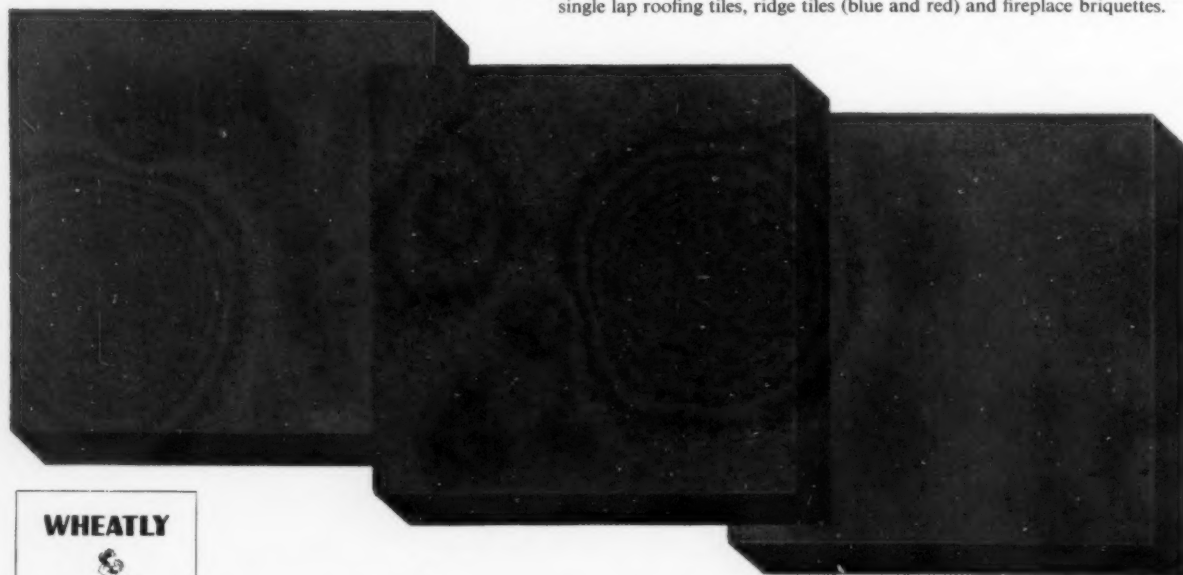
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Shelf.....	6 ins
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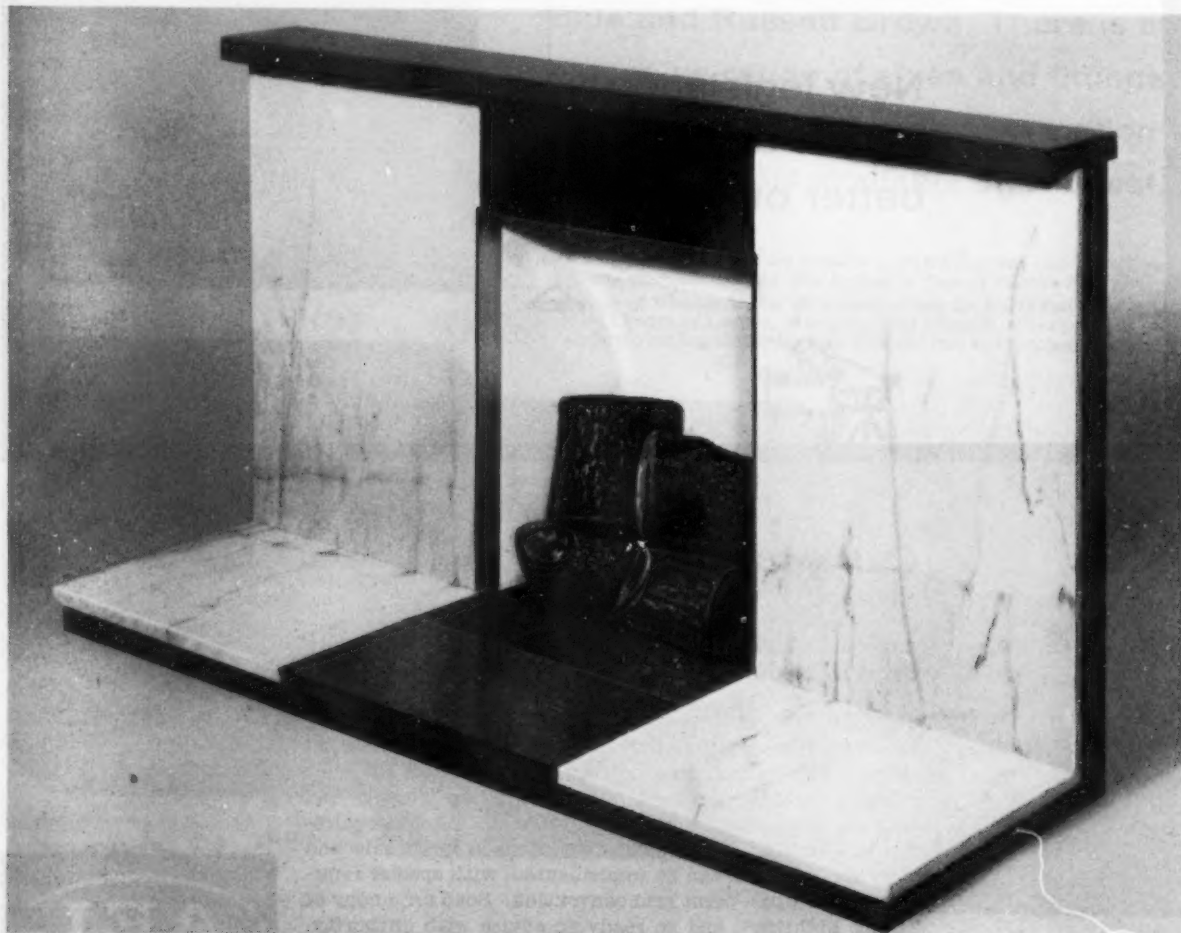
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- A. Pink marble/Mottled black marble
- B. Red and pearl grey marble/White marble
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FIRENZE A2



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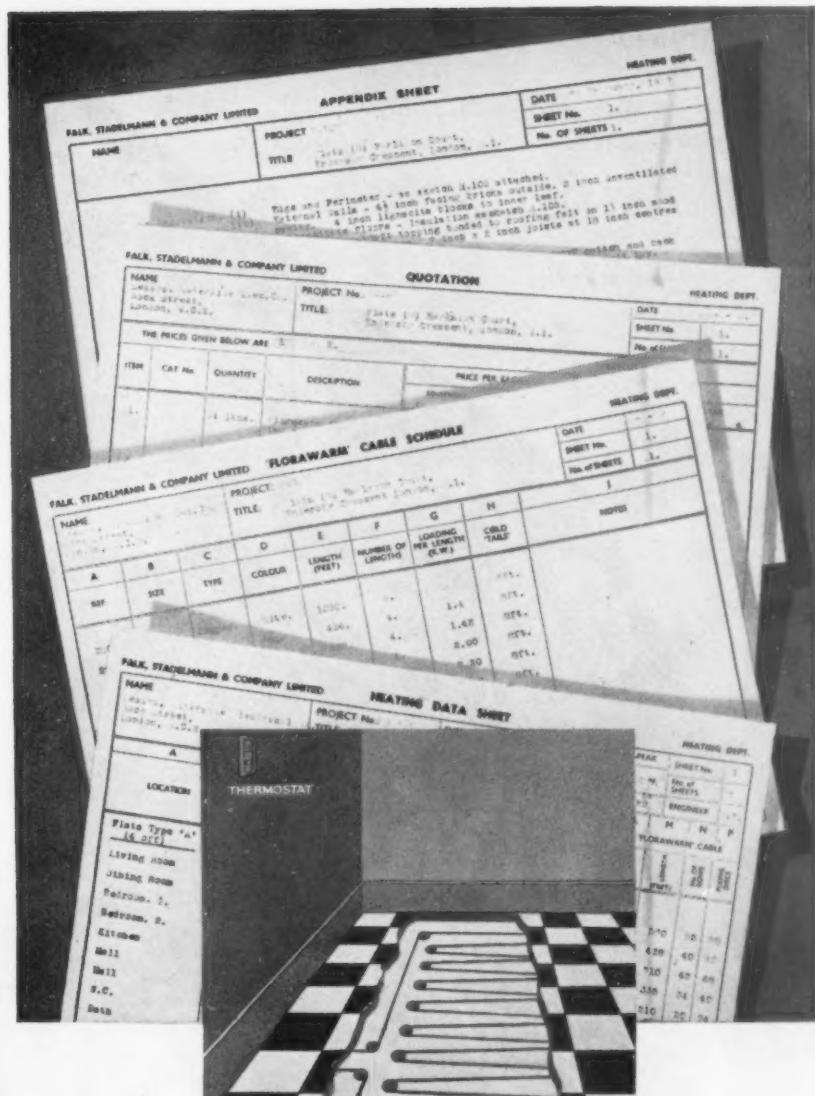
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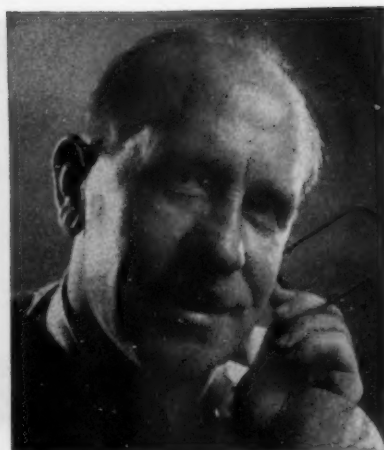




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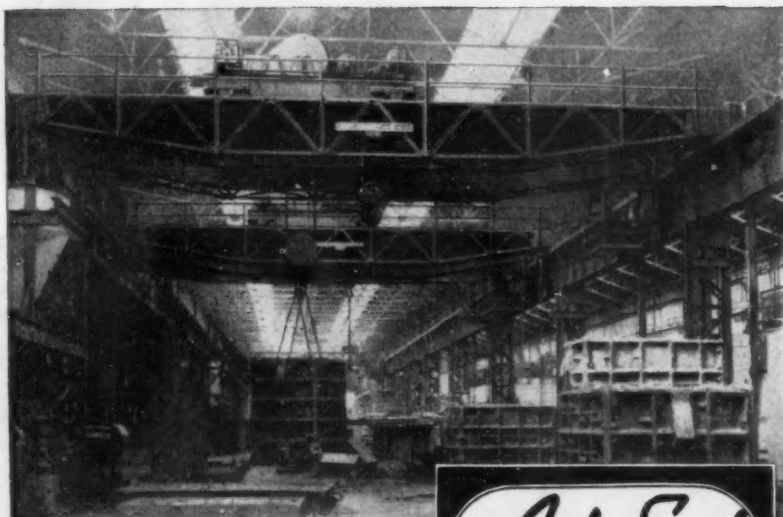


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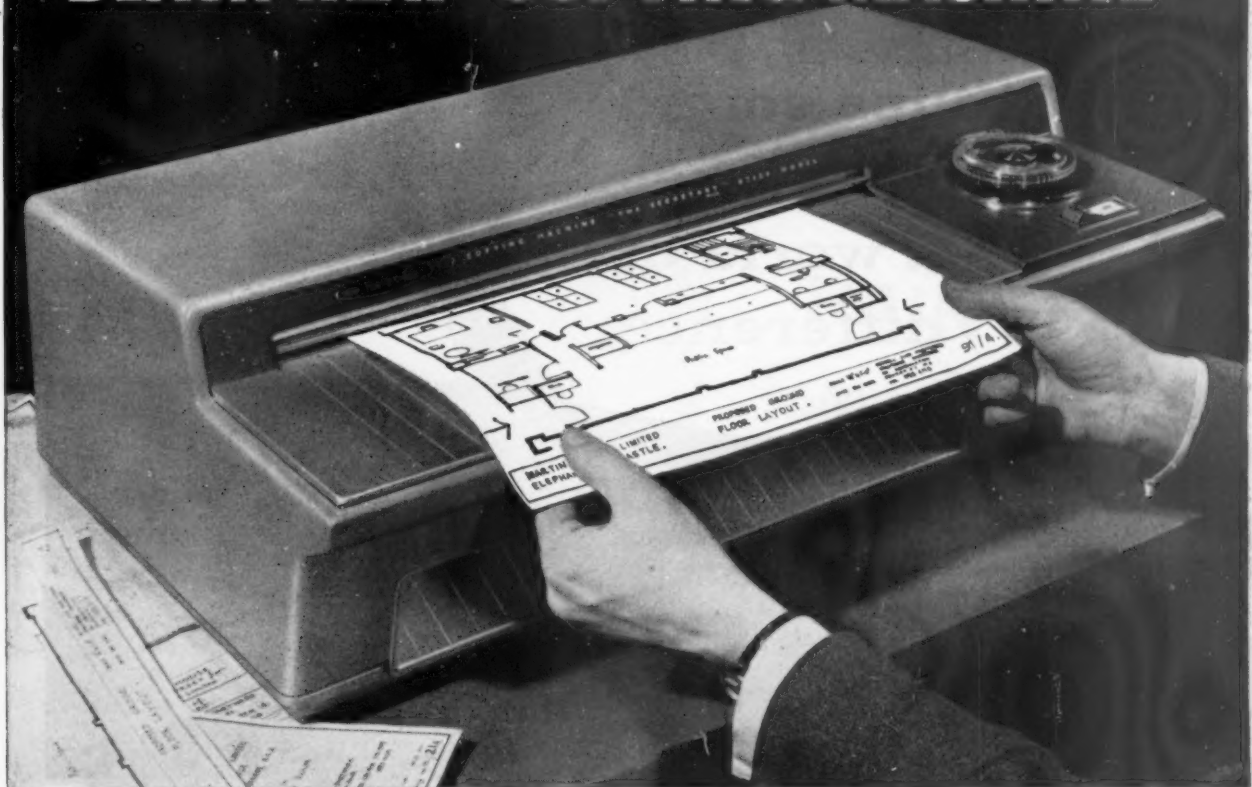
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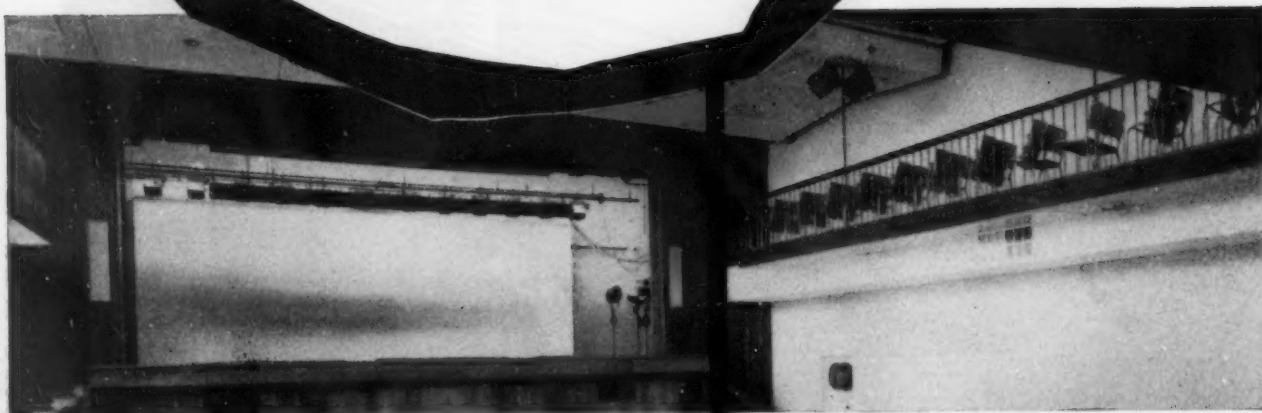
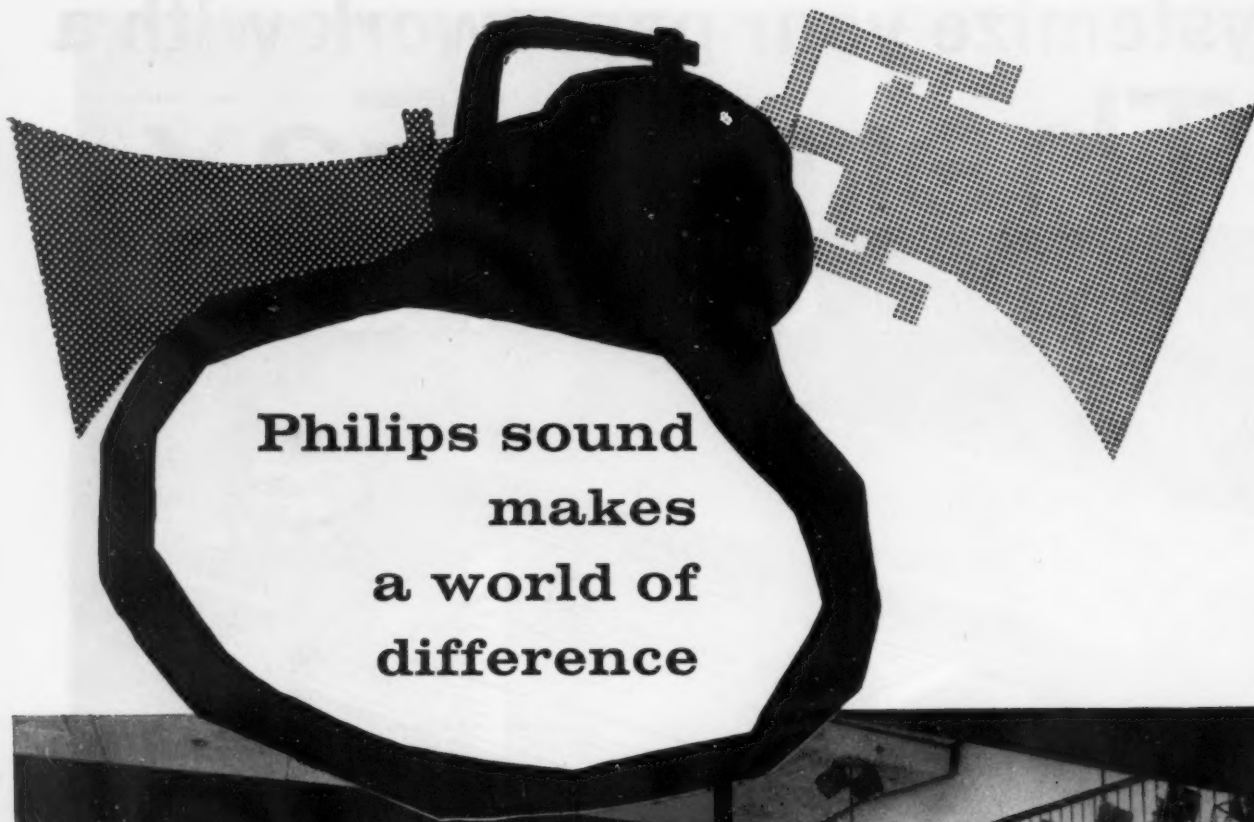
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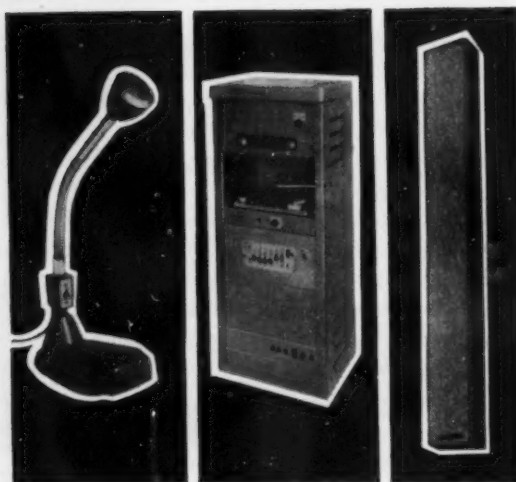




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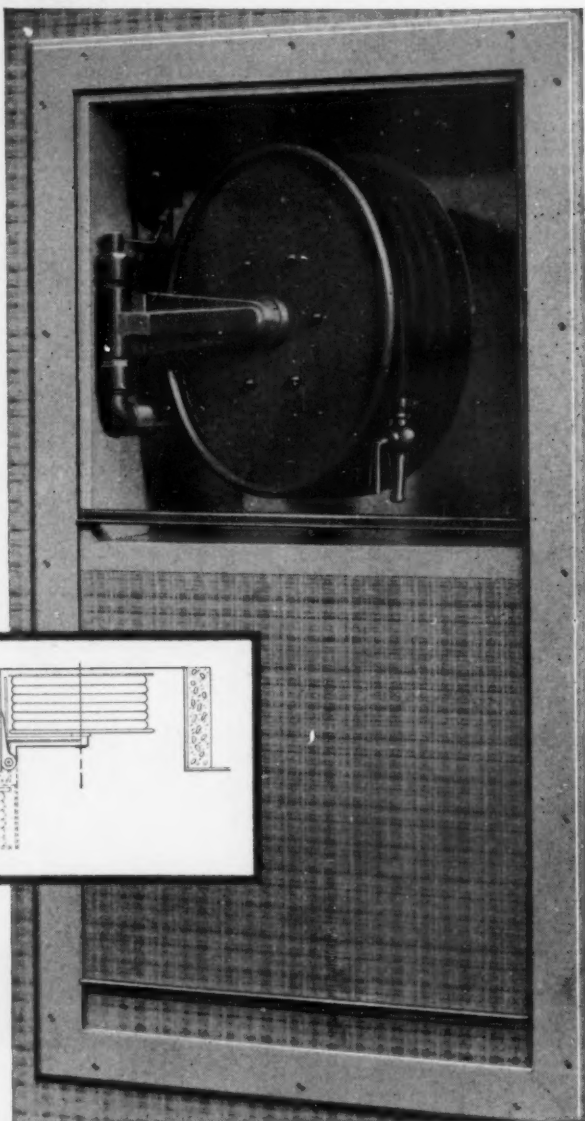
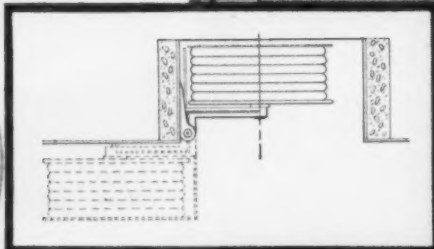
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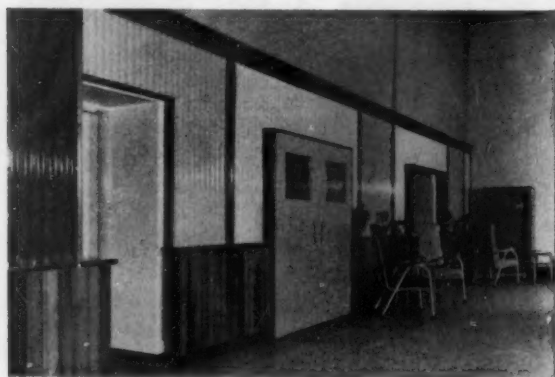


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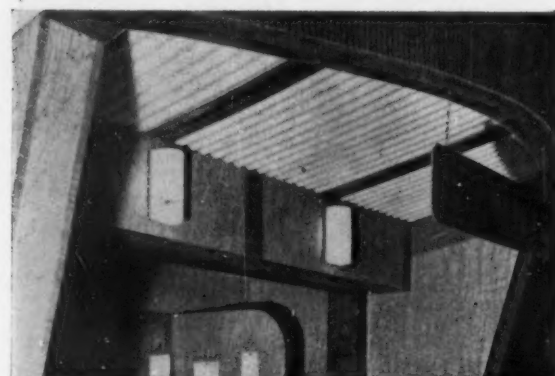




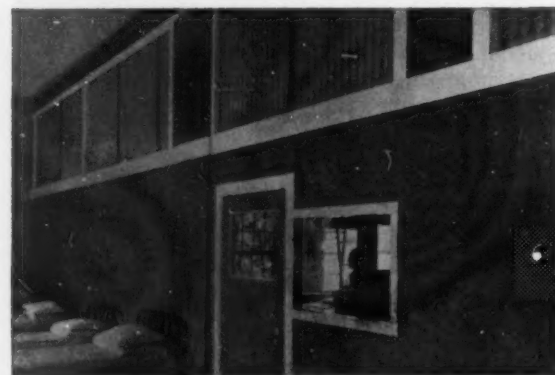
Corrugated 'Perspex' and 'Perspex' flat sheet used in dividing walls.



Corrugated sheet installed in the end wall of a ward day-room.



Corrugated 'Perspex' used in the ceiling of the hospital Post Office.



Corrugated 'Perspex' and 'Perspex' flat sheet used in dividing walls.



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Photographs by courtesy of the Lancaster Moor Hospital Management Committee. Installations designed by the Superintendent Engineer: Mr. W. M. Lewty, B.Sc.

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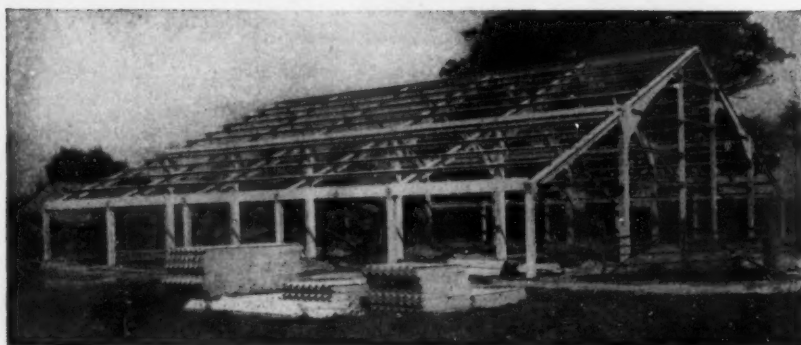
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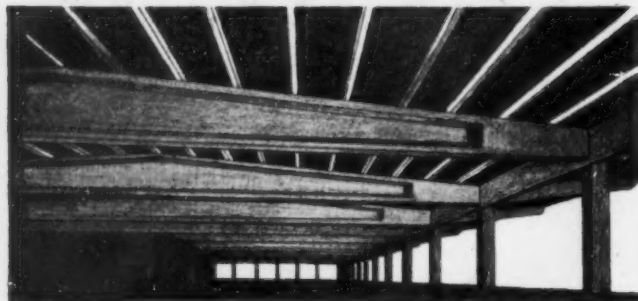


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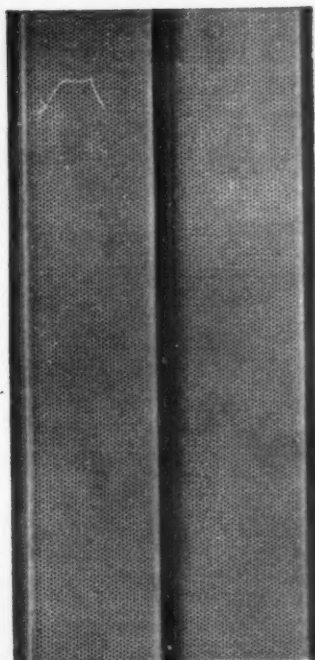
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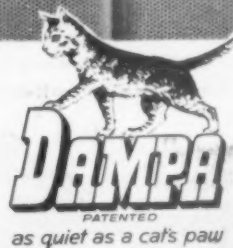


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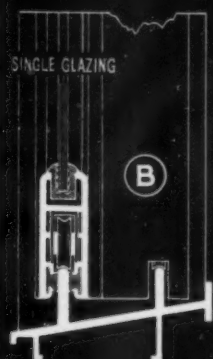
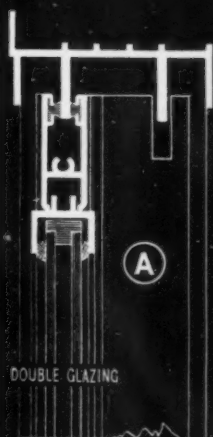
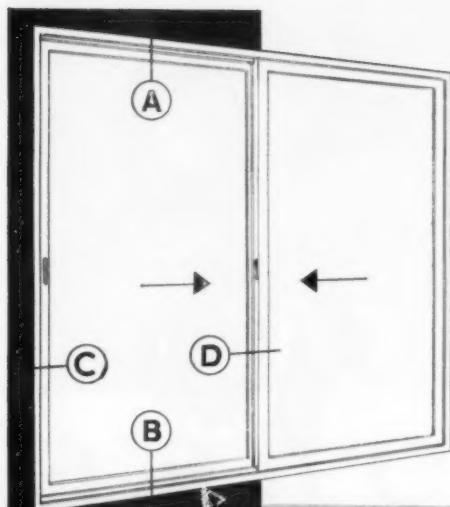
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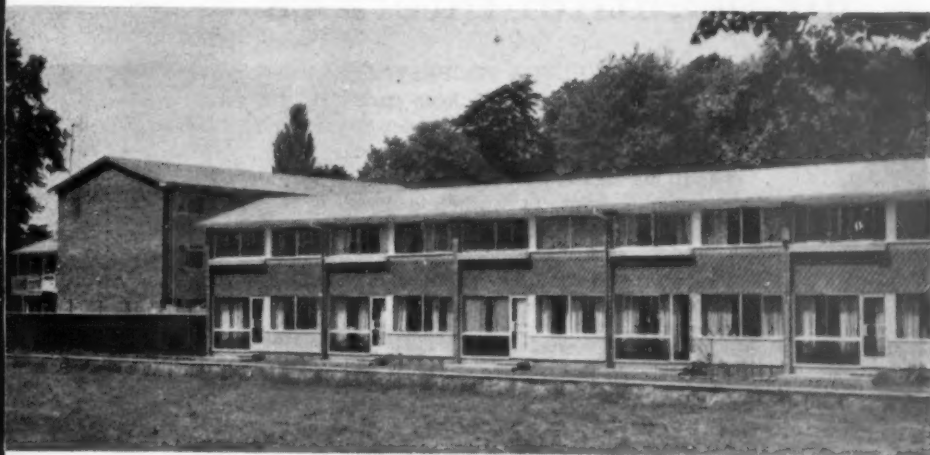
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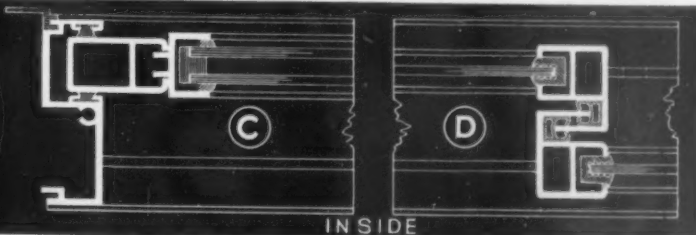
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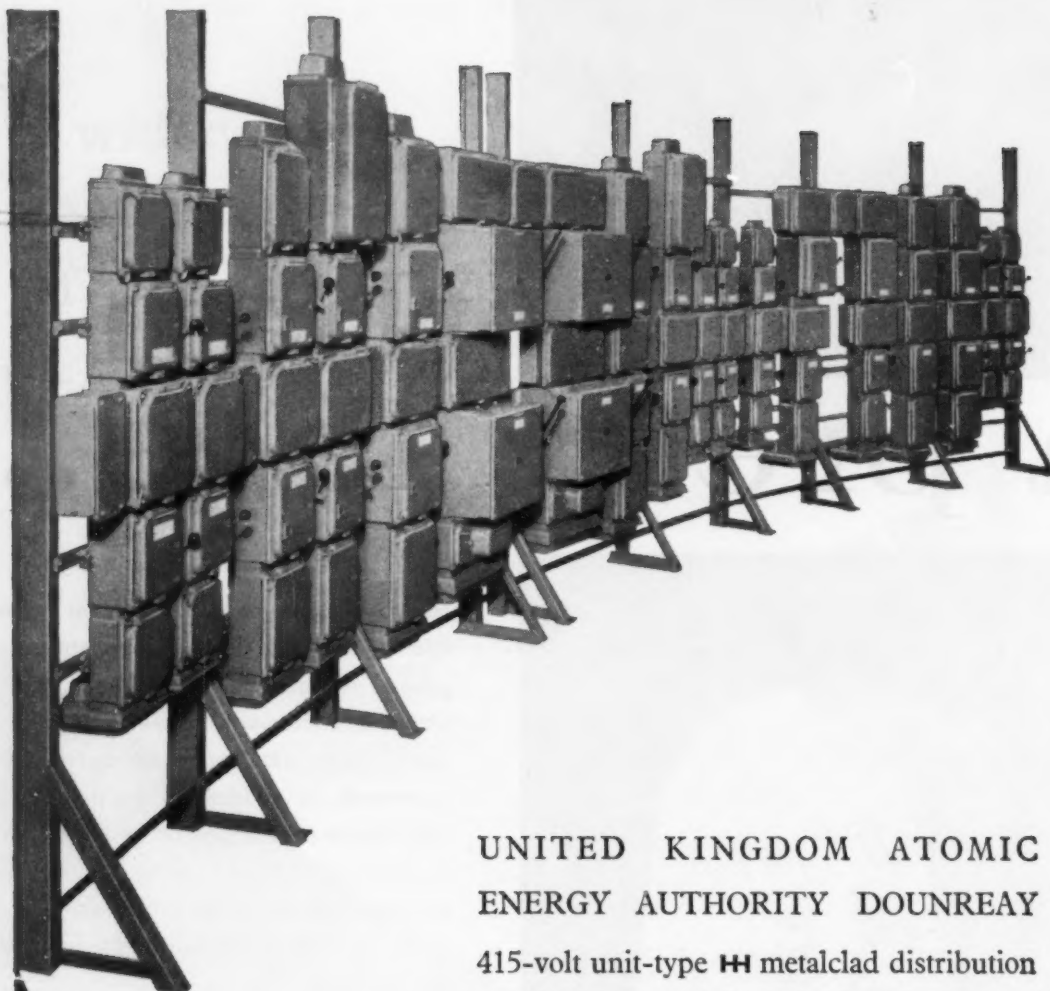
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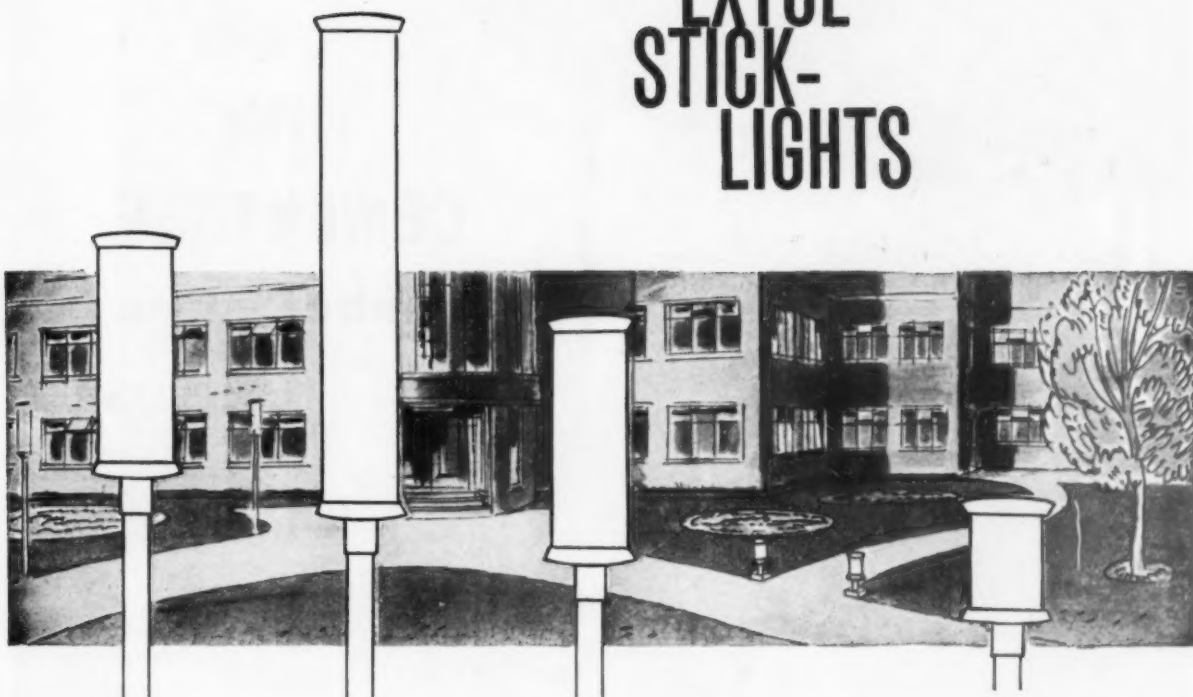
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# Modolite

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MODOLITE construction with its wide range of units provides for all requirements in this interesting field of architectural design. Our technical staff will be pleased to prepare full working drawings and quotations against outline details.



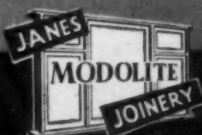
Flats, Gaywoods Factory Site.

Work carried out under direction of:—  
W. Bryant, Esq., A.M.I.C.E.  
Borough Engineer & Surveyor,  
Tottenham Borough Council.



Bridgend Blind School

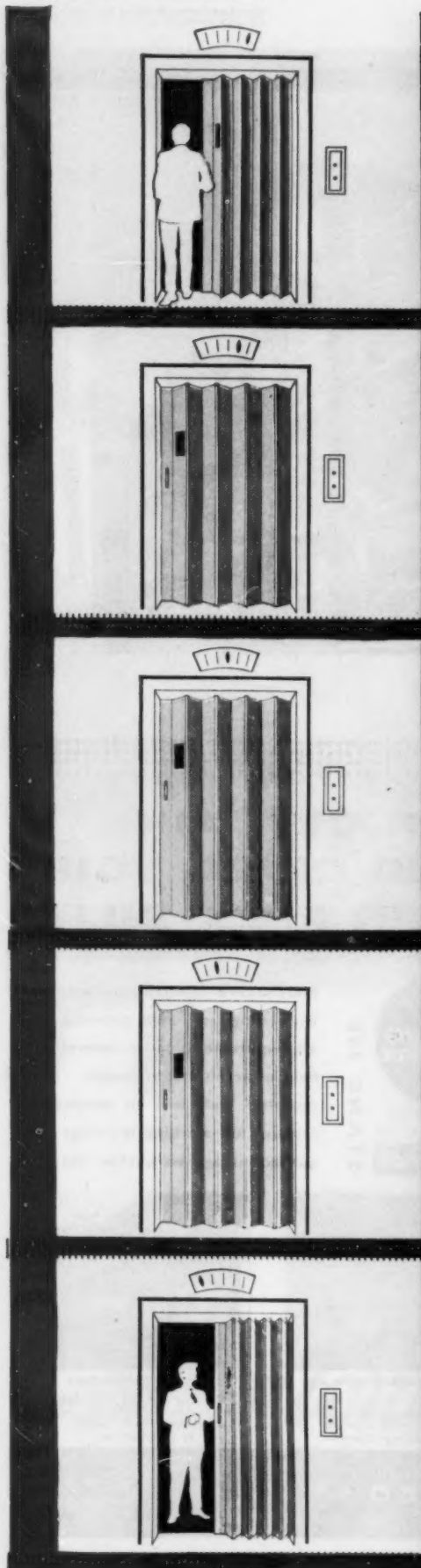
E. A. E. Evans, Esq., A.R.I.B.A.  
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Every lift door we produce embodies a wealth of long, specialised experience in the manufacture of doors and gates for industry and commerce.

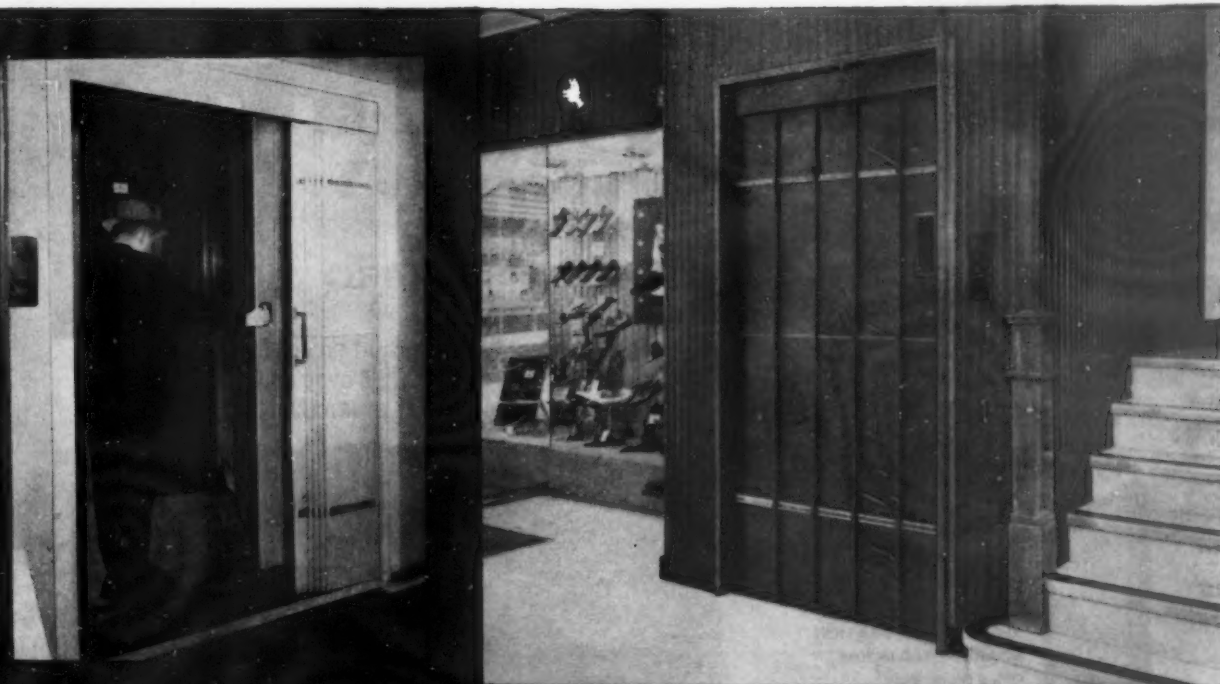
The success of Bolton lift doors is therefore soundly based on well-informed design, high standards of craftsmanship and the finest materials.

On to this basic superiority are built—in the case of shutter doors—such advanced technical features as totally enclosed tracks, non-ferrous hinging strips and twin ball-bearing pulleys.

These doors look good too, and are available in a wide variety of finishes to suit different decorative backgrounds.

For appearance, extreme ease of operation, minimum maintenance and long life, specify BOLTON Lift Shutter Doors. They are top on every point.





# BOLTON

Above left:  
The remarkable Bolton  
Multi-Panel Lift Door  
which runs 'round the  
corner' is ideal for  
contemporary settings.

Above right:  
Multi-leaf door.

Below: (left pair)  
Closed and open views  
of a lift shutter door.

Below: (right pair)  
Two-speed sliding doors,  
of which five sets were  
installed in the same  
premises.

As well as the types shown here, the  
BOLTON range of Lift Doors includes fireproof  
shutter doors, single panel sliding doors, two-  
panel centre opening doors, and vertical  
sliding bi-parting doors for goods lifts. Read all  
about them by sending for leaflet

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# Noise

is no problem

with

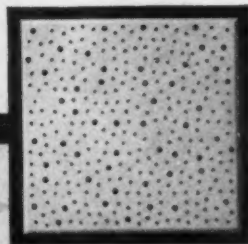


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REGULAR PERFORATION  
BOARDS USED IN New  
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Headquarters British Railways  
*The Regional Architect under the  
direction of The Chief Civil  
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Ankarboard is of maximum efficiency in sound absorption—thus eliminating noise-stress and improving working and living conditions. At the same time, it provides unbounded opportunity for decorative schemes, and can be fitted easily in several ways. Ankarboard Acoustics are available as boards or tiles  $\frac{1}{2}$ " or  $\frac{3}{4}$ " thick in regular or random perforations. Regular perforations are 4 m/m at 15 m/m centres and random perforations are 4 m/m and 7 m/m holes. Holes are of the necessary depth to provide maximum acoustic correction.



### ACOUSTIC BOARDS

Supplied with shiplap joints on two long edges and are available in 12" or 16" widths by lengths of up to 16ft. All acoustics are supplied surfaced with white washable paint and can also be obtained surfaced with fire retardant paint to Class I BSS 476/53.

### ACOUSTIC TILES

These are bevelled on all four edges and are available in 4 sizes: 12" x 12", 12" x 24", 24" x 24", 16" x 16", ( $\frac{1}{4}$ " thickness only).



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New Offices for:  
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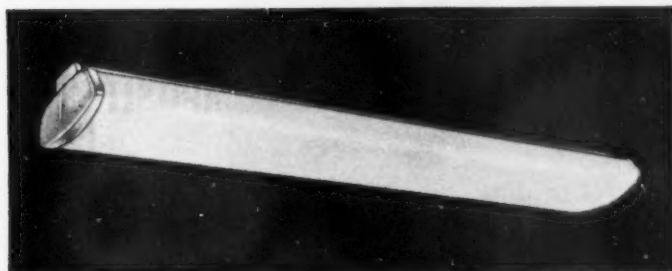




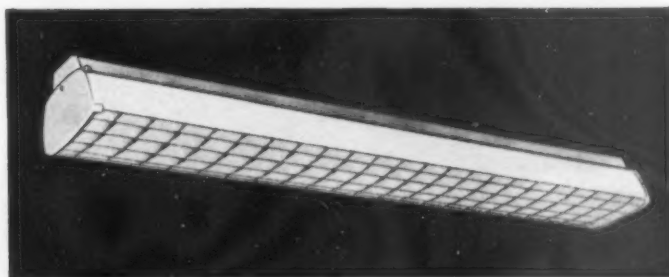
# 'New-Range'

## FOR OFFICES SHOPS AND FACTORIES

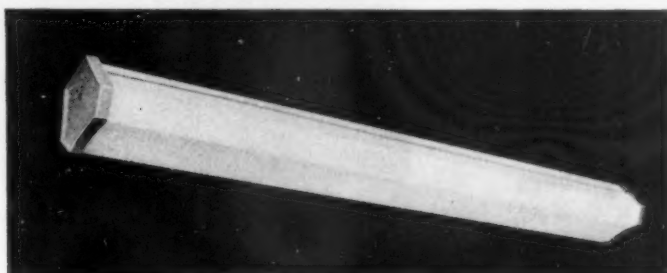
**ECONOMY.** Why let high costs eat away your profits? 'New-Range' fittings compared with others of similar size can save 5%-12% of your lighting bills. 'New-Range' control gear saves watts and, by operating at maximum power-factor, keeps kVA charges at the lowest possible level.



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These facts about 'New-Range' are worth considering when you are planning lighting: Our branches throughout the country will give you all the information you need: and they have the fittings in stock.

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FLUORESCENT LIGHTING FITTINGS



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#### ARMoured OR COMPOSITE

*sliding, hinged or folding  
automatic or non-automatic*



Mather & Platt Hinged Composite Fire Doors

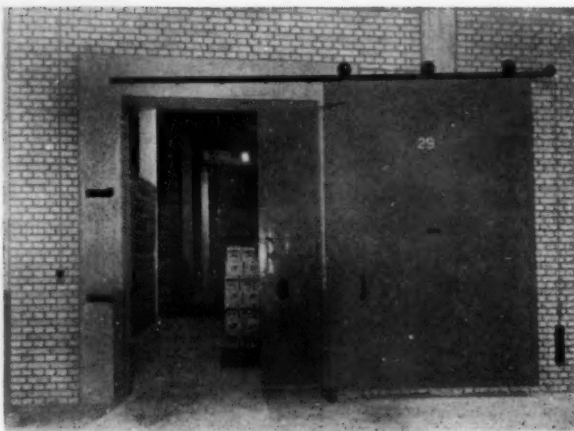
One of twenty-eight pairs of Mather & Platt Automatic Sliding Armoured Fire Doors installed at the warehouse of a famous food manufacturing concern.

Architects: J. Douglass Mathews & Partners  
in association with Skidmore Owings &  
Merrill, New York.

Fire Protection Engineers  
for over 70 years.



A110/2



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# CURTAIN WALLING

By

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Telephone : Central 5866

GLASCRETE cast stone facings to beams and columns with infilling of cast stone mullions and COL-O-ROCK exposed aggregate panels were incorporated in this new office block at Olympic Way, Wembley.





Fleet Building for the Post Office.  
Architect: W. S. Frost, Esq. A.R.I.B.A. A.M.P.T.I.  
*Photograph by kind permission of the Ministry of Works.*

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*\*Sole manufacturing rights in this country.*

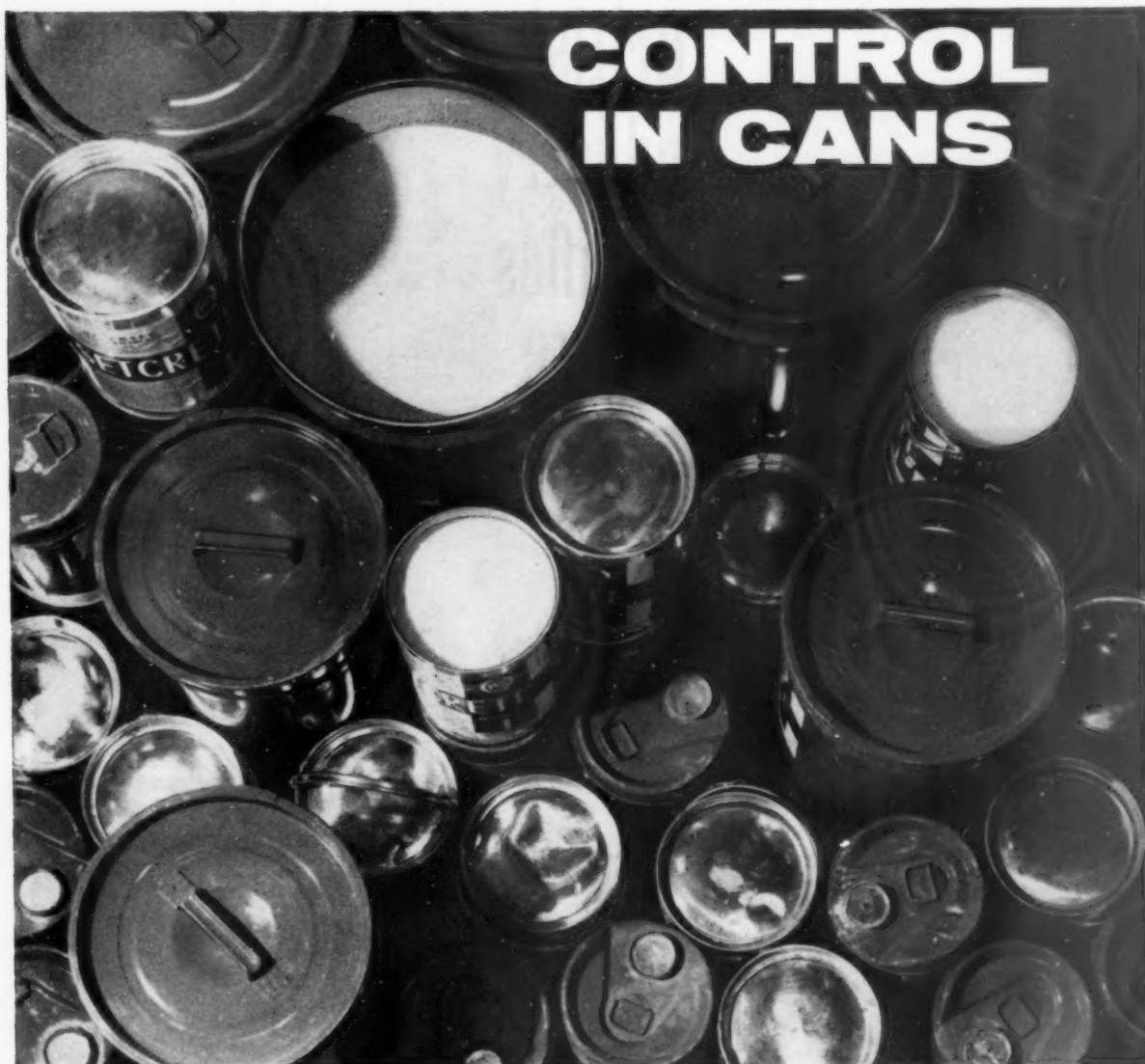
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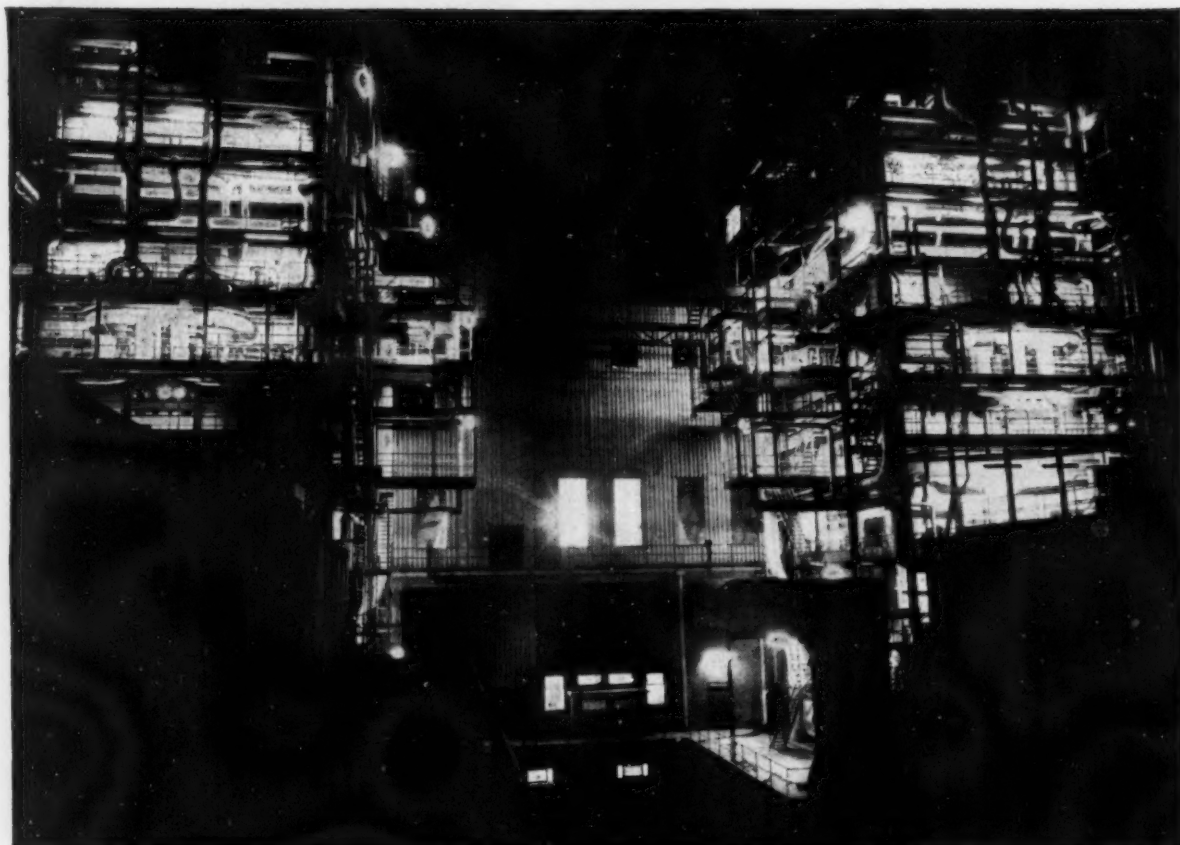
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FALKS, the long-established lighting specialists, designers and manufacturers of all types of fittings.



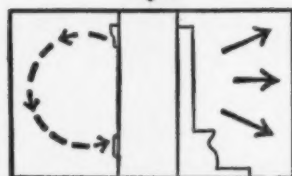
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AP172



warm air in the kitchen . . .



from the living room fire



. . . and hot water too

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PRICE from £15 18s. od. retail (Supplied with throat restrictor, without interior frame or grilles).

#### Performance (Boiler model)

ROOM HEATING: full heating in rooms of traditional construction up to 1,500 cu. ft. *plus* background heating by convection in adjacent room up to 1,000 cu. ft., or full heating in one room only up to 2,000 cu. ft.

WATER HEATING: 7,500 Btu/hr. (Max. 10,000 Btu/hr.)

*The Chevin Mk IIIa is approved by the Domestic Solid Fuel Appliances Approval Council.*

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**CONVECTOR FIRE**

a Radiation product

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STAND NO.  
417G/418F

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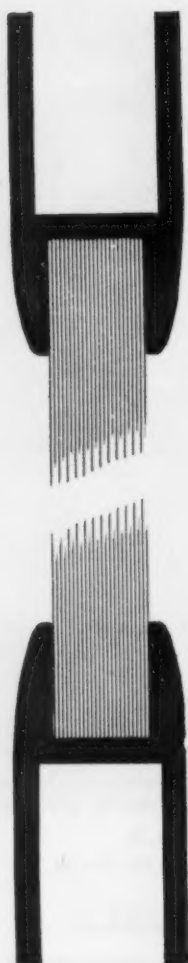
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small-bore heating with Sunbrite.  
The piping system is easily installed  
with the minimum of structural  
work and is quite inconspicuous  
in this characterful interior.



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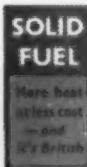
Please send me Information Sheet No. 1.

NAME \_\_\_\_\_

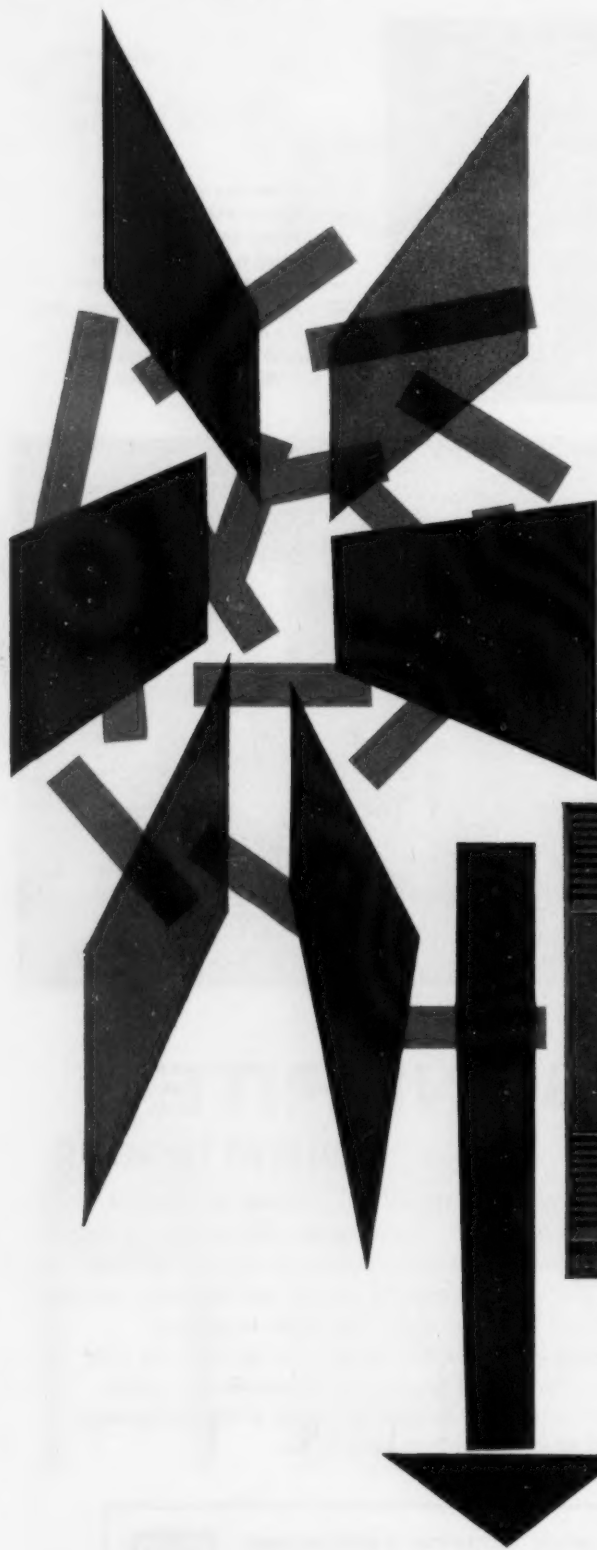
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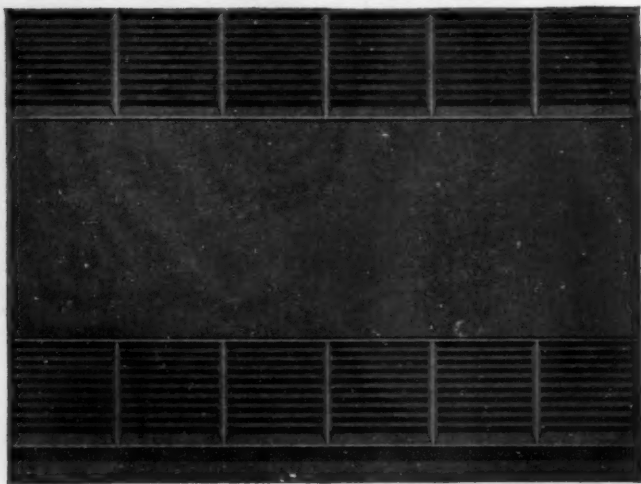






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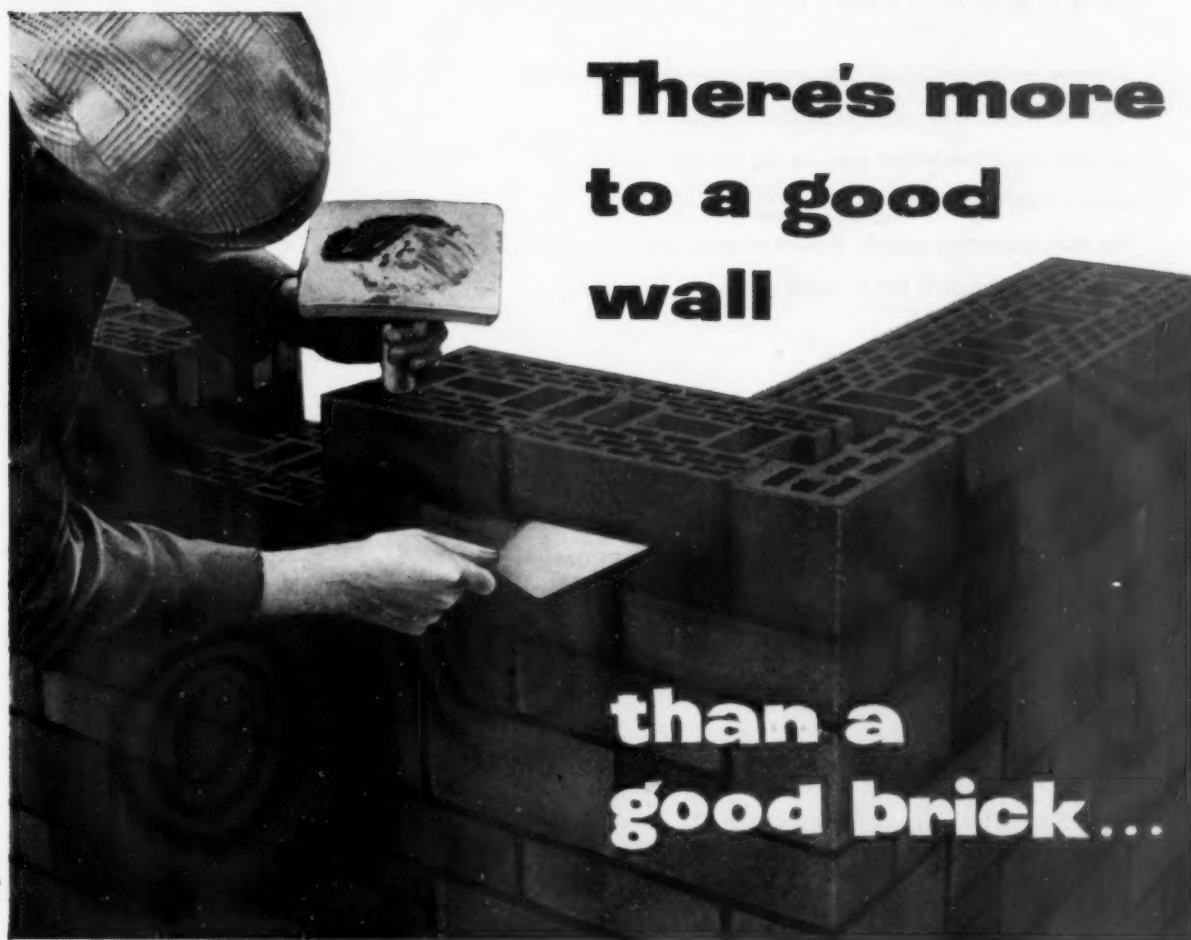
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**and that means the mortar . . .**

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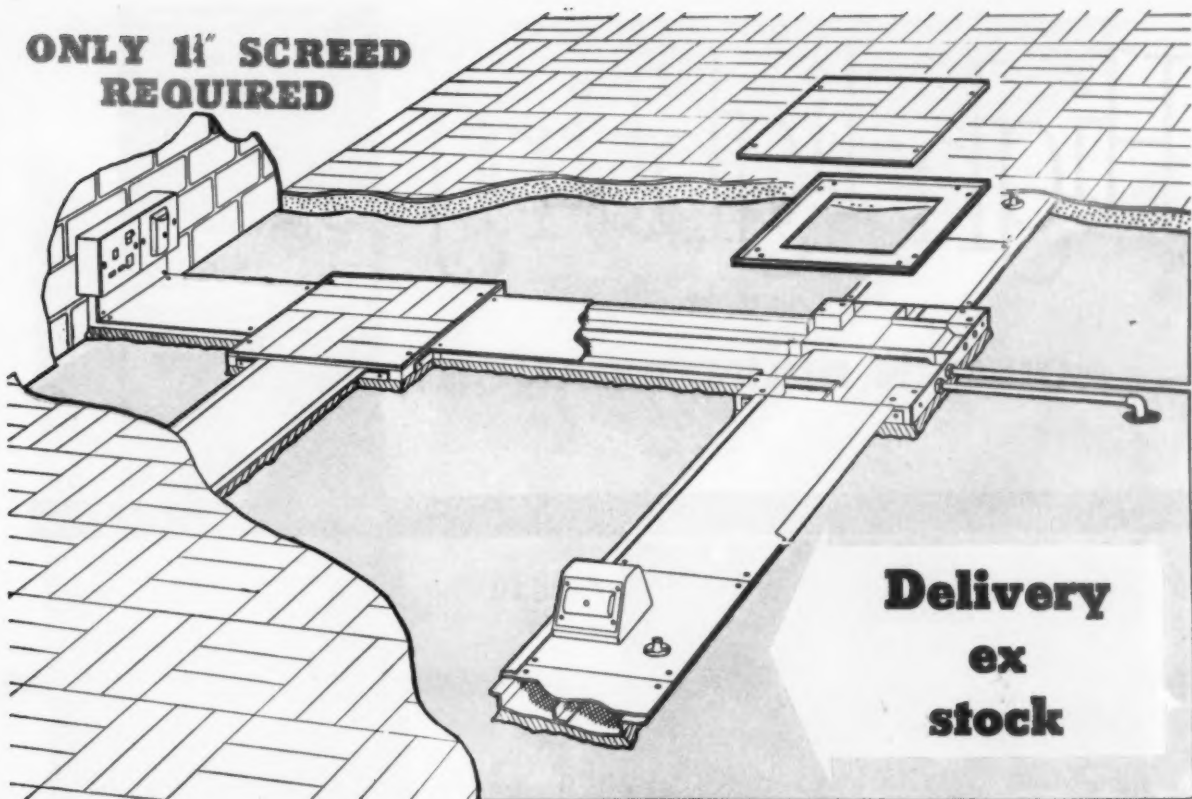
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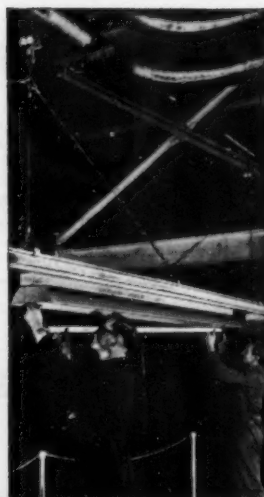
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GC 71



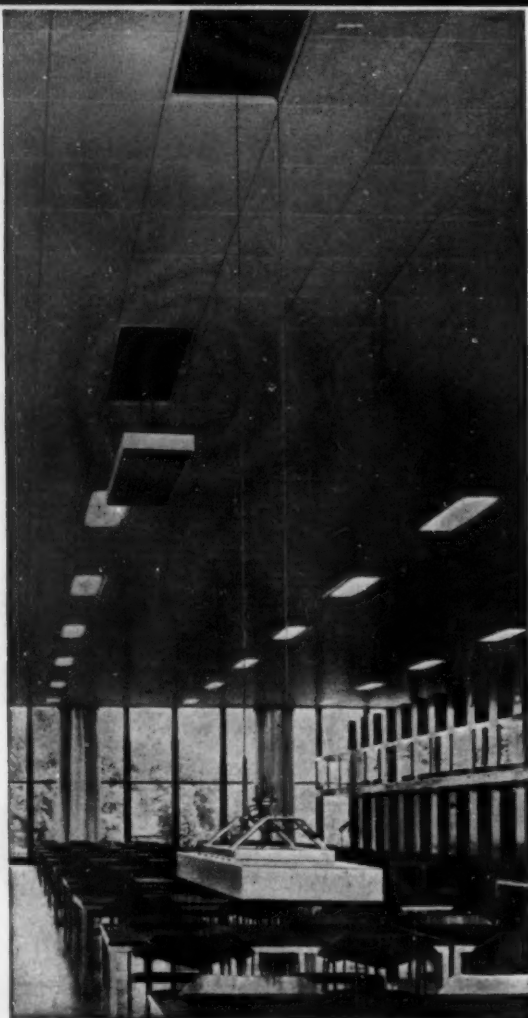
# High-lighting

... BUILT-IN MAINTENANCE!



*Above:* L.E.F. Gear is installed in the Boiler House at Vauxhall Motors, Luton, to facilitate maintenance of fluorescent trunking.

*Left:* Modular lighting in the new library at Sheffield University is serviced by means of specially designed L.E.F. Gear.



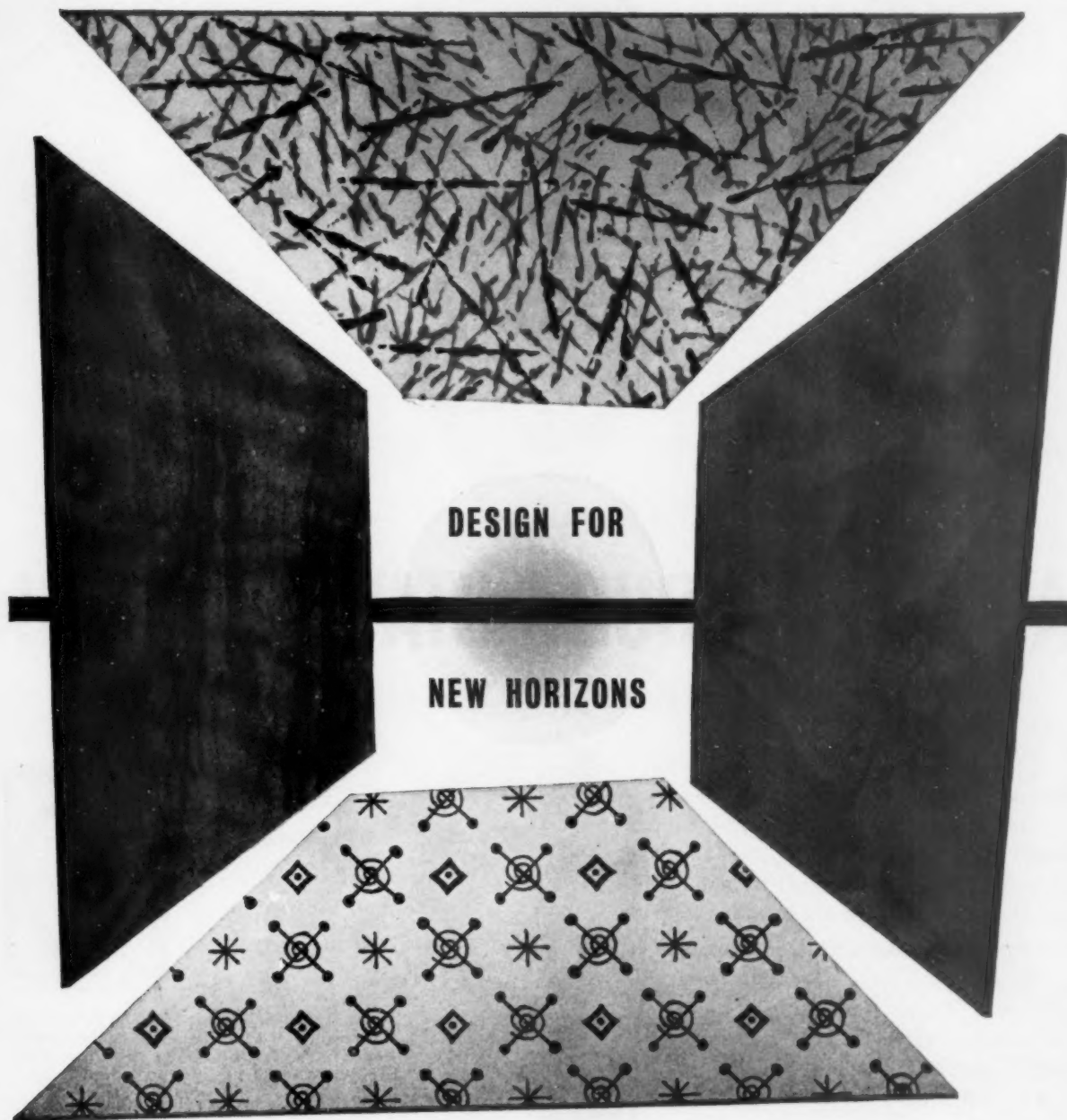
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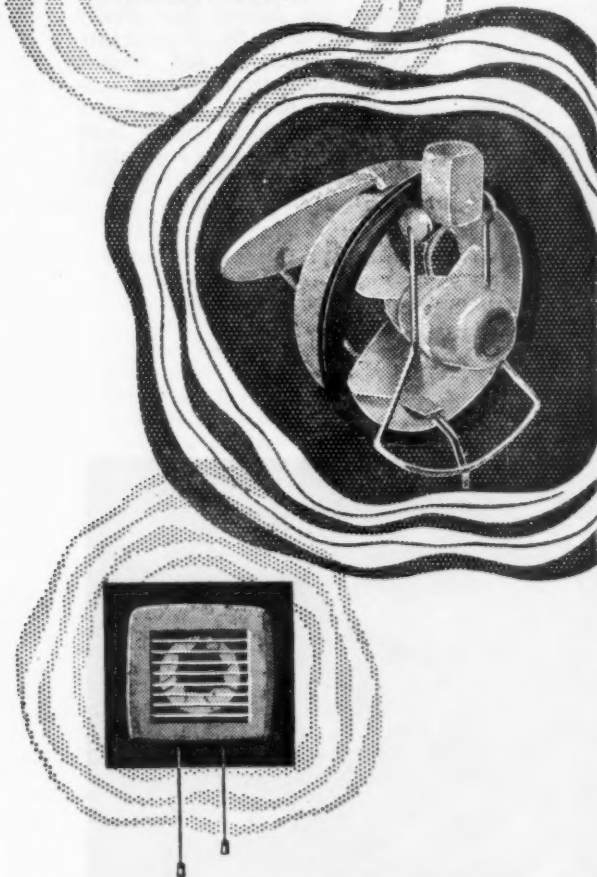
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Controlaire window fans give a variety of air movement and range of adjustment which is unobtainable from any other ventilation fan on the market. What's more, there is no need to buy expensive accessories, because all necessary features have been taken care of in the original unique design. You pay the basic price; there are no extras—you don't need them! Also available is the new wall fan, every bit as efficient as the window models, but designed for those with a preference for wall-fixing ventilation. Priced from as little as £6.19.6d.



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Volume 134 Number 21 November 22 1961

Registered as a newspaper

**The Architectural Press Ltd**  
9-13 Queen Anne's Gate, London SW1  
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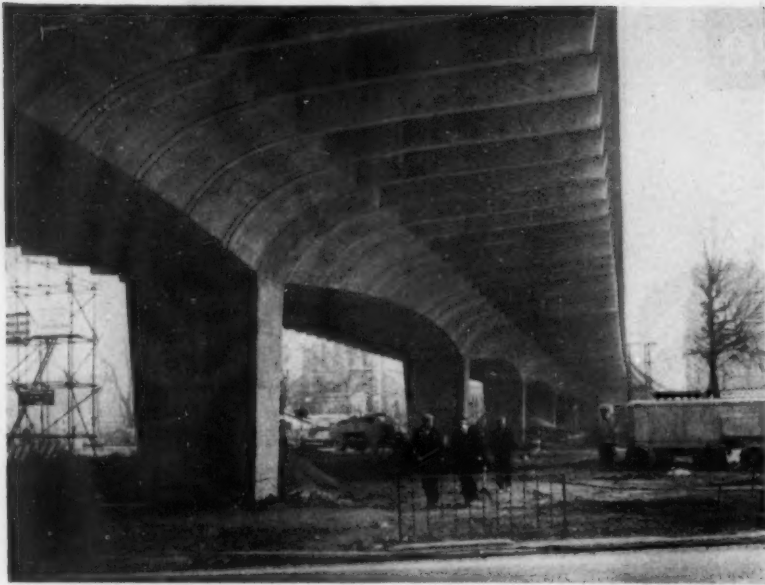
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## NOT QUITE ARCHITECTURE

### Help of the sick

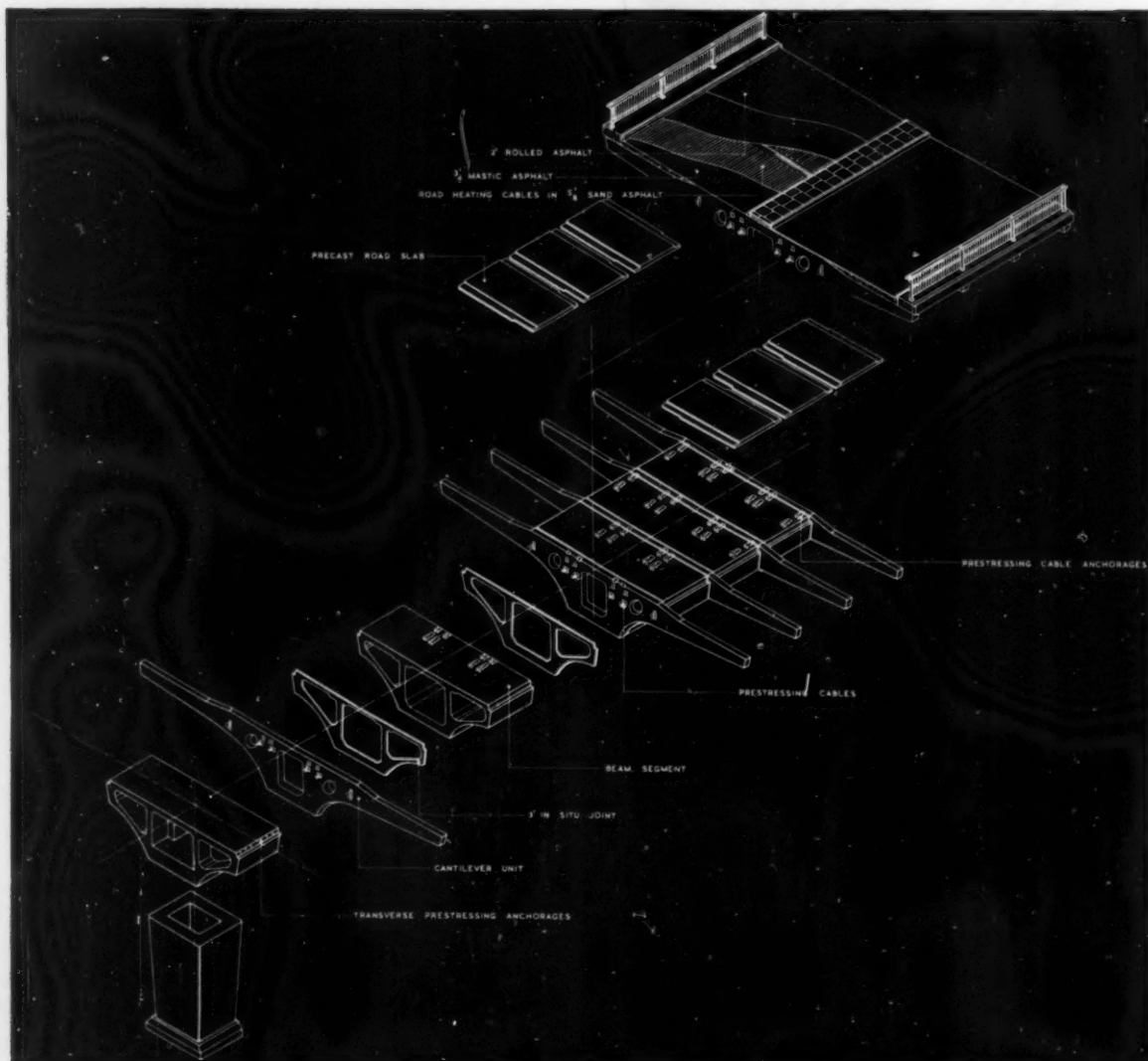
It wasn't your evening. You brought its failure with you on your shoulder. Even the charm and queenly genius of Mary Harvey in a splendid hat couldn't change anything for you, nor could shaking hands with a real ambassador. With the party getting going you belonged in the thick—DIA, coïd, toys, where the hell? Why toys? An arrow took you up to gardening tools, knick-knacks, transistors, still none of it the Swedes. Then you located in a sequestered sanctum even higher up in the Design Centre. It wasn't full of DIA but some had bothered. A woman argued with a Croat man, her pink gin resting on an exhibit. The Swedes you liked. Mainly furniture and glass. Mr Personable mates Miss Functional and their numbers multiply unexceptionable and together they all live happily ever after. Perhaps it could happen in the right sort of places nowadays—conscious, ordered felicity. Could it? You started to think. Because you were starting to think you drank and stopped looking and because you were forced to listen you stopped starting to think. What forced you to listen was not noise but its gradual diminution, that awe-inspiring, ineluctable subjugation of a party hubbub by officialdom in the cause of high station, the rather ingratiating, I-know-my-own-place-sir approach and yet, underneath, the mad dog determination that you shall be shown yours. Downstairs the addresses were short: Sir Gordon one minute, the Swedish ambassador less.





Opened last week, Hammersmith flyover is a notable advance on the Chiswick flyover or the M1 bridges. It is the work of G. Maunsell & Partners, in collaboration with the LCC's architect Hubert Bennett and chief engineer Joseph Rawlinson, with the Road Research Laboratory and the Cement and Concrete Association. Application of precast concrete techniques (shown diagrammatically below) has greatly reduced labour on the site and produced an exciting and elegant structure. Refinements include anti-icing electric heating and a safety fence to withstand impact from heavy vehicles. But why footpaths? A pedestrian was mown down with in half an hour of opening.

## Hammersmith flyover





You never went back. You gave the Swedes a miss. You had seen it in *The Observer* and *The Sunday Times* and you never went back, but spent the time calling for drinks, talking, smiling at friends and hating everything around you, the togetherness of bright bright talking hats, blind waistcoats, deaf cigarettes. It was fizz. What should matter but the finished design, the end-product, the artefact and who cared that it was upstairs or in heaven or in hell or anywhere else? Not many. Everybody. We good bad clever stupid people, we cowardly brave of a bat-blind overcrowded little island sitting waiting for the nuclear bombs and the lion roaring as he burns. You took another drink. A woman brayed, "So materialistic the Swedes, so bloodless, so superficial." What should you do? Beat her over the head with that "Mobo" tricycle or try to get her into bed? Neither. You walked away. An official deigned to invite your opinion. You said there wasn't much of it, meaning of the Swedes.

"Oh, we saw to that," said the official. Then smugly and self-righteously, "No more than they gave us." In the mood you were in you could have brought your knee up. Then this official tried to introduce you to your interlocutor, a lady, pretending to forget your name but you foiled him with malicious delight. Why should he pretend? It was a bit far-fetched. He knew you well enough.

Worse followed—Stanislav. What was wrong with Stanislav? The core of your good designer friend Stanislav was sea-green aesthetic incorruptibility, diamond-hard, safe beyond erosion, and yet look at him now as he slid and slithered socially about, feeling for leads, openings and introductions, the wily fellow. The jungle had turned him into a reticulated python. You left him to it. Now fewer waiters were about, so you grabbed a final drink for your chip's sake. What was the matter with you? You knew all right. It was the news you had heard before you came, the news about Mary Harvey. She was giving up the DIA. That was the big news. You did not blame her for retiring. You just felt rotten about it. Even if DIA re-orientation was imperative her departure was the occasion, not her work the cause. For 14 post-war pioneering years she had held the DIA together with warmth, charm, humanity, tact, all the values, and with dauntless dedicated powers of bedrock female intuition that made the DIA safe in her hands. Now that she was to go you feared for something, perhaps for the DIA itself. Your mind meandered: if she was to go couldn't it be to queen a small country somewhere with her infallible instinct for rightness? Concepts of monarchy were vindicated by her. You stepped out into Haymarket with the chip only a little lightened. It would stay up there for a while, perhaps a long while. You felt very unhappy about everything. *Poenā damni*, pain of loss.

ROBIN MUDIE

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\* To preserve freedom of criticism these editors, as leaders in their respective fields, remain anonymous.

## The Editors

### AN ANSWER TO THE HOUSING SHORTAGE

At last the London housing shortage is having a thorough airing, although the various politicians who have discussed it, in the House of Commons and on television last week, seemed very much busier blaming each other's policies for the long-foreseen and tragic situation than in putting forward a solution. Nor was it generally recognised in the debate in the House that the families the LCC finds on its hands are a symptom of our complete failure to build houses fast enough to keep pace with growing demand and catch up with obsolescence. The homeless families are not just a London problem: many come to London for work and opportunities that do not exist elsewhere, and the cities of the North have housing problems just as bad as London's.

To reduce the magnetic power of London needs a long-term, political solution, but to find ways of gearing the building industry to much higher productivity is a challenge to the building industry and to our own profession of architecture and town planning. At least twice the present rate of house-building is required. This can only be achieved by full application of advanced technological research to this field of building, just as its application to schools at a critical time produced speedier building and better value for money.

It is encouraging, in this bleak situation, to be able to report this week on the first project of the recently formed MOHLG Development Group (see page 985) which, starting from a brief to investigate the housing needs of old people and provide an answer, has clearly pointed the way towards a technological break-through comparable with the CLASP break-through at the MOE, and which we can expect to be followed up in a whole series of projects in the future.

Whatever emergency measures the Minister of Housing may decide to take for the immediate relief of the housing shortage, here is the signpost to the long-term solution of the problem of building enough, and building more cheaply.





#### BUILDING EXHIBITION

Housing Minister Dr. Charles Hill's first speech to the building industry was a good one for a beginner. Opening the Building Exhibition last week he asked for close collaboration between architects, builders, manufacturers and all specialists. No one can take exception to this, provided that the collaboration takes place on professional terms: that is, for the benefit of society first, the client second, and the industry last. Best of all was Dr. Hill's reiteration of the importance of studying the needs of the users of buildings, and for the use of architects and landscape architects.

\*

Frank Russon, president of the National Federation of Building Trades Employers, and one time guest editor of the AJ, proposing a vote of thanks, put in a strong plea for improved productivity by manufacturers, pointing out that a building programme based on the country's needs was useless if there was the likelihood of shortages of materials and components.

\*

The building exhibition itself is now so large, and so full of gin traps that ASTRAGAL has but the haziest impression of it after spending only an afternoon there. There is more order to it, thanks to the pressure

being applied by the Montgomeries, but the visual chaos of dozens of designers in competition remains. Congratulations are due to the attempts to introduce A4 sfb classified literature, to John Brunton on his library, and to officialdom generally for the standard of design and presentation, which seemed in advance of private enterprise—but particularly the MOHLG for their display of the old people's flats.

\*

After the hurly burly of the exhibition the quiet colours and soft Eames-created comfort of the RIBA room was a great relief: a design triumph by architect Roger Worboys, and created through the generosity of John Perring and 16 other firms.

#### HOUSING THE DISABLED

I liked the exhibit put on by Mrs M. A. Montgomery. Although it is called "Housing the Disabled" its purpose is to suggest that both safety devices and an improvement in the placing of standard equipment could well be applied to all houses, not only to those with cripples living in them. Among the new products on view are a gas fire with a control switch at the top, so you don't have to bend down to reach it. an oven with a shelf that moves up and down when you turn a handle near the main switches and a window opening-bar which operates with a flick of the most arthritic wrist.

\*

I liked some of Mrs. Montgomery's own ideas, too. Certainly it's time that houses had ramps to at least one door instead of steps: they would be just as useful for prams as for wheelchairs. And most working and cooking surfaces in the kitchen should certainly be on the same level—something the Design Centre has often suggested to manufacturers who can't be bothered to standardise heights of equipment.

\*

I'm glad to hear, by the way, that the Centre is planning an exhibition of products for safer, easier living. The subject is, in fact, very much in the news at the moment. There is to be a conference on "Housing the Disabled" at the Building Exhibi-

tion this week, sponsored by the Polio Research Fund. And as some of you know the Architectural Association has started a research fellowship on the subject. Research is beginning in Scandinavia where, I am told, there is even a block of flats in which people in iron lungs live with their families during the day and are moved upstairs to their own built-in communal "hospital" at night.

#### COVER POINT

This week's AJ has two covers (no kidding, have a look for yourself). The outer cover is one in the series of covers announcing the progress of the AJ's sfb technical information supplements. But inside this is a special glossy cover prepared by Gee Advertising Ltd. for John Ellis & Sons, which would normally have appeared during the fortnight of the Building Exhibition. As this would have disrupted the series of sfb supplements Ellis's gallantly forwent their right to the outer cover and took second place.

#### SIXTH SENSE

If I haven't called your attention before this to Granada Television's current sixth-form series on design it is because most of you cannot, I imagine, join in the habits of sixth-formers and sit about watching the telly on a Wednesday afternoon. But now this filmed series is past the half-way mark, with three programmes to go (including, I am told, an exceptionally good defence by Shirley Conran of "expendability" in industrial design), I must report that it is really outstanding. We have had Professors Nikolaus Pevsner and Misha Black, Dr Banham (with two information-packed half hours) and Paul Reilly—all giving ungimmicky, well-illustrated lectures. The latest, by Misha Black, with the neat title "Saucepans and Mammals," showed the sixth form audience that the varied work of a designer is only one per cent inspiration and 99 per cent common sense and hard work. I don't think many viewers would have suspected that the design of a saucepan could be so complex a business, or that once such a product was apparently completed it would prove to need drastic modifications.



This series, which was produced by Patricia Outram and supervised by Granada's head of school broadcasting, Sir Gerald Barry, has one thing missing. Although Misha Black touched on architectural design in a reference to his project for a mammal house at the London Zoo, and Reyner Banham more than touched on it, there has been no speaker in the series to give a clear picture of the architect's work. The less crowded profession of the industrial designer has been far better explained. May we have a look in when another series is mooted, Sir Gerald?

#### ELEVATED HUMOUR

Mr Punch so often teases us nowadays that a lot of his jibes about design go unreported here. But the other day he piled it on thickly, with yet another cartoon about the Design Centre, a sick House-and-Gardenish feature about designing and furnishing an atom shelter ("Fall-out Shelters Can be Fun") and a piece "for women" by an architect's wife, called "The New Brutes." This last article—on the eccentricities of the sort of architect who refuses to provide his client with big bathroom windows because they would be "a jolt in the flow of the facade"—could have been much funnier. I'm surprised that an architect's wife couldn't provide a longer list of brutish features. What about Peter Womersley's *Sunday Times* house, in which the boxed-out wardrobe was "expressed" on the elevation? And isn't it time someone took the mickey out of those architects who keep messing about with window frames for the sake of elevational effects. A friend of mine who is about to move into a spec house is bothered because some of the frames have only two openable windows—one almost out of reach above the head and the other equally out of comfortable reach at floor level.

#### AWAY FROM THE DAILY MAELSTROM

Gimmicks of this kind are present in some of the buildings illustrated in *House and Garden's Book of Small Houses*.<sup>\*</sup> But on the whole this is a good collection. Why, then did the book elicit depressed comments

from my colleagues as it moved smartly from desk to desk? Why did one of them find these good—even exciting—houses "faintly grotesque," while another thought them "highly sophisticated essays in easy living where you would always have to think of something bright to say"? I suppose the trouble is that too much gloss on too many pages is bound to be indigestible. But just because we are so familiar with many of the designs and types of designs shown, we should not forget what excellent propaganda such a book can be to the newcomer to architecture. How much better it is that someone should pick up a copy of this book rather than one of the usual *Daily Mail* guides. Apart from the actual houses illustrated there is a lot of useful information—on furnishings, fittings, mortgages and so on. And the editor has flattered his readers' intelligence by quoting house costs beside the dates of construction—assuming they will deduce that what was £3,000 in 1951 would not cost as little as that today.

#### NOT-SO-PEDESTRIAN PRECINCTS

What makes Coventry such a special place? Somebody asked me that question last week after watching a cheerful television programme on the rebuilding of the city and consumers' reactions to it. There are not many towns where you would find the same mood of post-war optimism, the same knowledge among the people of what the local authority was trying to do, or the same firm support for long-term planning from local councillors. Reasons for Coventry's success could be the council's continued belief in planning; the appointment of first-rate architect-planners, who have been trusted to carry through their job; and the recognition by both councillors and planners that planning is for people and that the people of Coventry should be kept in the picture about what is being done in their name. The television shots of people gathering round the shop windows of the new Architecture and Planning Department, to examine models of the next stages of the City plan, showed how this policy is paying off.

\*

Public interest is now being stimu-

lated for Coventry's revised Development Plan, which will carry comprehensive development to the periphery of the city and will involve many decisions to preserve the green belt. Meetings are being arranged in every ward and in all kinds of organisations, a pamphlet has been produced to explain the plan, and school children and other young people are being invited to put in their individual ideas and comments. Other authorities, please copy.

#### NO BURY SEIZURES

By the time you read this, West Suffolk County Council will, I hope, have approved a remarkable document—Donald Insall's report on what to do with Lavenham. Like one or two other tourist-spots in East Anglia, Lavenham is in a parlous state structurally, and is liable to become a mess if not nursed and cared for. In his report Mr Insall painstakingly works over the condition of the buildings and the advisability of keeping or discarding non-mediaeval additions to them. He also studies their architectural merit and their contribution to the townscape, investigates the intricacies of ownership and tenants' responsibilities, reviews the sources of finance for renovation and the market for renovated houses, and is generally so thorough that the councillors must have expected a complete register of wormholes and a mycologist's report on local varieties of *merulius* L as well.

\*

This impressive piece of research is followed by twenty sensible recommendations on what to do next—the sort of recommendations that seem to imply well-founded faith in the aims of an equally sensible planning department. The proposals, if accepted, should save Lavenham from the two fates that confront many other towns of this sort—one, decay and death; the other, worse than death, the kind of inane prettification or classical trimming that makes Little Walsingham so nauseating to behold and is currently giving Bury seizures.

ASTRAGAL

<sup>\*</sup>*House and Garden*, 50s.



# LETTERS

J. Brunton, diparch, ARIBA

Peter Burberry,

diparch, ARIBA, ARSH

Richard Darlington

Moir Mathieson,

secretary, Council for Visual Education

Hugh McIlveen, MA, ARIBA

Ewart B. Redfern, ARIBA

## SfB

SIR: Cecil Handisye (AJ, 18.10.61) has put his finger on a source of increasing confusion regarding sfB, which we hope the alphabetical index in the RIBA filing manual will dispel. This is the question of where to put building products. Unwittingly the AJ has added to this confusion by publishing the sfB main tables, with the elements listed first. The sequence in the actual authorised tables to be published by the RIBA lists Theory and Construction first, followed by the Elements, which is the original Scandinavian sequence. Furthermore Bullivant's description of the classifying process (AJ, 17.10.59; 24.10.59) does not help either. Various discussions of mine with the original sfB authorities have shown quite clearly that the proper and original sequence of sfB is of particular importance. In the form to be published by the RIBA, it follows the time sequence of the building cycle and also, in a very loose way, the headings of the standard method of measurement. Briefly this can be described as follows:—

A/B THEORY AND MANAGEMENT. Background knowledge and generalised preliminaries.

C/X CONSTRUCTION. Trade preambles, general materials and workmanship. Products before fixing.

(1)/(6) ELEMENTS. Fixing / assembly, during and after construction.

(7)/(8) EQUIPMENT. Equipping and planning of spaces in buildings and special buildings.

(9) BUILDINGS. Complete buildings.

With a picture of this time sequence clearly in mind, it is obvious that anything to do with a trade product or services should only have a construction letter, since their selection must take place before construction commences. Thus the cladding manufacturer quoted by Handisye was quite right in using a construction letter, which was presumably U. In cases where products are solely attributable to an element like a window or a boiler, these should receive an X in addition to the proper elemental number.

Actually, the Scandinavians would write this as x(31) or x(56). The fact that authorised British practice is going to be (31)x or (56)x does not seem to matter. The point is, that the use of construction letters in this way serves as a useful distinction from the more general list information which only requires an elemental number.

It is desirable that manufacturers (and for that matter any other originator of technical information) should pre-classify literature and in doing so for general distribution, it is vital that they do this according to standard conventions. This does not stop the recipient (if he wishes) leaving out many of the construction headings and filing mainly by elements. Nor does it prevent filing by trade headings (Construction) if that is desired. It must be quite clear, however, that this is an individual use of sfB.

Having used sfB according to the conventional methods for about two years, I have found it a workable and effective tool. It is also usefully flexible for dealing with standard details, specifications and bills of quantities. We have found that there has so far been very little material which requires elemental files, their current contents are limited mainly to published design detail and BRS digests, this shows clearly a sad gap in technical information. The AJ is therefore to be congratulated for attempting to fill this gap with what appears to be an extremely valuable contribution. I would only ask that they make it perfectly clear that their elemental emphasis in classification is an individual one.

Finally, I would take this opportunity to correct one recurrent error in AJ classification. Anything to do with the planning or equipping of space or building types should be either (7) or (8) and not (9) as has so often appeared.

JOHN BRUNTON  
London SE12

*We cannot accept John Brunton's contention that construction comes logically before elements. The architect, because he is the chief decision maker in the building industry, is the chief user of sfB; but the architect always starts with a building type and a building element and proceeds from these to decide how he is going to construct. It is quite wrong to argue that, because elements are usually made up of construction components, the components must, therefore, come first. There is an analogy here with words and letters. Words are made up of letters. But you do not go about with an A in one hand and a B in the other, trying to think how to make up a word. You start with your notion of a word and find the letters to fit it. It is essential to the success of sfB that in this crucial matter, it should follow the architect's thought processes. We are aware that the committee of the RIBA responsible for publishing the sfB/UDC Building Filing Manual have decided to alter the sequence of Table I and Table II. We do not think that this matters very much, but in so far*

*as it matters at all, it seems an alteration in the wrong direction.*—THE TECHNICAL EDITOR.

## EDG: Drainage

SIR: I am appreciative of Mr Wickham's remarks (AJ 8.11.61), and of his kindness in putting forward detailed information. I cannot however agree with his suggestion of a wrong impression. Some points in his letter call for comment.

I do not accept, nor would I expect other architects to anticipate, that the drains or sewers serving housing estates carry continuously running "hot" water. Flows from quite large groups of houses will be intermittent, and by the time that flows from very large groups of houses run steadily for appreciable periods, the temperature of the combined flow, including a considerable proportion of cold water, is not likely to be deleterious to pitch fibre pipes.

Laundries are, as Mr Wickham quotes, cited by the Building Research Station as an example of continuous hot flow. His description of laundry discharge as an industrial problem requiring special conditions is perhaps misleading. Liquid produced by laundering may be discharged to the sewer without special consent by the local authority normally required for trade effluents (Public Health (Drainage of Trade Premises) Act, 1937). The Institute of British Launderers say that laundry effluent is of a domestic character, but with a lower concentration of more easily treated detergent.

The discharge of petroleum to any drain or sewer communicating with a public sewer is, as Mr Wickham states, prohibited (Public Health Act 1936, Sect. 27). It is therefore reasonable to assume that the slight concentration of petroleum carried into drains in some buildings will not harm pitch fibre pipes. Mr Wickham does not however refer to installations requiring special treatment or separation before discharge to the sewer. Architects may well be concerned with this type of problem, and will undoubtedly take special steps to reassure themselves on the properties of the liquid and its effect on drain materials.

I take the view that architects reading the original brief reference would have drawn the correct conclusions.

PETER BURBERRY  
Shoeburyness, Essex

## Mumford and money

SIR: I agree with Eric De Maré that we are all dotty "if we expect to create a culture worth having under the existing self-immolating and restricting monopoly."

Further I would suggest that the present monopoly has done little to save itself from self-destruction, for we, the youth of today, have little stimulus to really live even though our fathers have built



a welfare state, an "affluent society," and the new towns. Around the latter gangs of us youths prowl the streets with no positive challenge to our energy, other than the destruction of trim front lawns and chain link fencing.

Some of us, true, have seen the challenge of the starving and ill-housed two-thirds of the world: but where do we start? What training have we been given to understand basic human needs?

The rest of us either vegetate, or accept the challenge of money, whether above or below the law, and as Eric De Maré says, this is self-destroying.

Our fathers have tried but something is wrong. Professor Mumford has told us what is wrong and what is needed but, from what I have read of him, he has missed out the motivating force which I feel is behind his life's work, and should be behind ours, namely his concern for others' welfare. This Christians call love and through this, I suggest, there is a possibility of creating a culture worth having.

RICHARD DARLINGTON  
Leeds 2

## Cfve

SIR: We were very gratified to be given such a rousing send-off by ASTRAGAL (AJ, 1.11.61), although we are not certain from the paragraph heading *Cfve* whether we have inadvertently become a part of the new sfb filing system. If any readers are interested in the slide index, or would like to help the council in any way (even to the extent of sending us some money), our address is 55 Park Lane, London, W1, and we should be very glad of their interest and support.

MOIRA MATHIESON  
London W1

## Comprehensive design group

SIR: While Mr Munce (AJ 27.9.61) deplores the "loose association" of a number of small firms establishing Design Groups, and probably sums up correctly the faults of such organisations, there can be no doubt that the reason lies with the necessity to present at least to some prospective clients, details of an impressive number of qualified and other staff, and the advantages which this is assumed to provide compared with the average small practice: by its intrinsic nature ill-equipped to handle more than a limited volume and type of work, and yet possibly anxious to have a share in whatever may seem to be more interesting, and at the same time more monetarily rewarding than the usual size of contract handled in perhaps a limited economic and social field.

The staff potential is obviously important, but this does not indicate necessarily a genuine desire to effect a com-

prehensive "service" other than that normally expected, and certainly not the all-in type which larger organisations attempt to provide, and which are the result of a great deal of planning effort, and probably additional and costly outlay.

Unfortunate though this may be, it is a recognised fact that here in Northern Ireland, in order to safeguard its interests, at least one authority investigates thoroughly these organisations "strength" mentioned by Mr McAllister. (AJ 25.10.61). While we would agree that co-operative associations which on face value satisfy many requirements are bound to be a thorn in the flesh of the larger and well knit unit, it would probably be more practicable to encourage such a course being attempted on a thorough and genuine basis rather than simply to make up numbers which satisfy some, but by no means all the conditions required to tackle a major project.

Criticism alone cannot achieve this, nor will it prevent those with initiative, but lacking perhaps capital resources and manpower, from attempting this form of compromise. The complications of such associations must by necessity be numerous, and even the primary requirements of administrative difficulties not easily resolved; apart altogether from providing a service for the client, whether fully comprehensive or not.

As the trend seems to be most marked in Northern Ireland at the present time, it would be interesting to have the views of architects who are concerned first-hand, or of others elsewhere in similarly "provincial" parts of Britain, familiar with a similar type of organisation.

HUGH MCILVEEN  
Belfast

## Henry Brooke

SIR: Was it really true that the removal of Henry Brooke from the Ministry of Housing and Local Government brought tears to the eyes of Astragal? (see AJ, 18.10.61).

Was he not the one who involved many of us in a further deluge of paper work by introducing Certificates A, B, C and D and Notices No. 1 and 2? If ever a sledgehammer were used to crack a nut, that was a prize example.

Also, under his guidance, the number of planning appeals increased from about 6,000 per annum to 12,000 per annum. They are now running at the rate of about 250 a week (!) and many of the decisions seem designed only to prevent private architects from earning a living. You ought to invite your readers to contribute to a series headed "Planning decisions—believe it or not"!

We shall have to wait and see whether the Doctor is any improvement, but if he needs "educating" (as Astragal sug-

gests), then we can only hope that he won't develop in quite the same way as his predecessor. Meanwhile, Astragal ought to refrain from being rude to the new boys in case they react by disliking all architects and planners on principle.

EWART B. REDFERN  
Exeter

## DIARY

LANDSCAPE AND CIVILISATION: Sylvia Crowe at Royal Society of Arts, John Adam Street, London, WC2, 2.30pm.

NOVEMBER 22

PHYSICAL PLANNING IN SICILY AS PART OF DANILO DOLCI'S PROGRAMME: Dr. Carlo Doglio opens informal discussion at the Architectural Association, at 6.15pm.

NOVEMBER 22

MODERN ARCHITECTURE—YESTERDAY, TODAY AND TOMORROW: R. Furneaux Jordan at RIBA, 2nd and 3rd lectures.

NOVEMBER 22 and 29

A CRITICAL REVIEW OF THE BUILDING INDUSTRY: Ian Leslie, editor of *The Builder*, at joint meeting of architects, builders and quantity surveyors, Henry Jarvis Hall, RIBA, at 6.15 pm.

NOVEMBER 23

FINLANDIA: Exhibition at V & A. Until JANUARY 7

MODERN FINNISH DESIGN: lecture by J. O. Gummerus, V & A, 6.15pm.

NOVEMBER 23

"That this house approves the minute of the Joint Consultation Committee that paid meal breaks should not exceed one hour per day": debate organised by the Faculty of Building, London Branch, at London Building Centre, 7.0pm.

NOVEMBER 23

DESIGN AND TRADITION: Society of Industrial Artists Design Oration by Sir Herbert Read, Royal Society of Arts, John Adam Street, London, WC2, 8.30pm.

NOVEMBER 27

NEW TOWN DEVELOPMENT: THE HOOK STUDY: Oliver Cox, Graeme Shankland and F. G. West at RIBA, 6.0pm.

NOVEMBER 28

THE BUILDING EXHIBITION: Olympia, 10.0am to 6.0pm (till 8, Tuesday, Thursday, Friday).

Until NOVEMBER 29

THE CRISIS IN BRITISH TOWN PLANNING: Lewis Keeble in the Anatomy Theatre, University College, London, WC1, 1.15pm.

NOVEMBER 30



# NEWS

## BUILDING EXHIBITION

### Minister appeals for co-operation

The great progress made by the building industry in devising new methods, materials and systems of construction "screams aloud" for the closest collaboration between the professions, businesses and trades in the industry, Dr. Charles Hill, Minister of Housing and Local Government, said in opening the Building Exhibition at Olympia last Wednesday. By this, he made clear, he meant much more than "the necessary minimum of formal consultation, even if it is polite," but "the fullest and closest teamwork, right from the very beginning, between architects, builders and manufacturers, not forgetting, of course, the engineers and other specialists."

Informal getting together, he said, would remove many problems, but what was needed was much more than this: "The need is for collaboration right through the building operation, so that each skill dovetails in with the others and plays its full part. . . You will not be wrong if you think that I am making the not entirely novel suggestion that buildings need architects, and landscaping needs landscape architects," said Dr. Hill.

"Alas, we know that there are people in some of our great towns who, even now, live and work in drab surroundings for which they themselves are not responsible. It is partly my responsibility—but partly yours too—to see that these people and their children are given good homes as well as an environment which will not stunt their growth as human beings."

## PLANNING OFFICERS AND MOHLG

### They asked for a rise—got a cut

Planning officers who have been expecting a retrospective pay increase going back to 1958 heard last week through the Institution of Professional Civil Servants, that the MOHLG has decided that they have been overpaid since then, and must accept a notional salary cut until their "debt" is repaid. The secretary of the IPCS, Mr Richard Nunn, has asked Dame Evelyn Sharp to receive a deputation to discuss the matter.

The attitude of the IPCS is that, before any kind of pay cut, notional or otherwise, can be imposed, the Ministry must set about it in precisely the same way as

the Staff Association side has to do, by stating its claim to the Arbitration Tribunal if agreement cannot be reached through direct negotiations.

The position of planning officers since 1947 has been that this grade enjoys what is known as a "salary lead" over the main grade of the Civil Service Professional Class. At the time of the December 1958 salary settlement his maximum was £1,785, which was £55 above the maximum of the main grade Works Group. The Ministry side now proposes that planning officers should receive the same scale as the main grade Works Group, and his salary lead should be abolished retrospectively, from August 1 1958.

At the beginning of this year a salary claim for the works group classes was taken to arbitration and won a substantially good award, back dated to August 1958, and the IPCS naturally expected that the official side would retain the salary lead for planning officers: instead they now propose to put planning officers onto the works group scale, backdating this to the same date.

Senior planning officers, with a salary level of £2,350 at present, had expected it to go up to £2,650 as from December 1958: instead the Department now proposes to cut this salary by £50 from December 1958, and from January 1961 to increase it by £42, to a figure of £2,392 instead of the £2,650 the Institution had every right to expect. Sixty planning officers are affected by the decision, in England and Wales: in Scotland a similar proposal has been made by the Scottish Home Department.

## DSIR

### Does it pay off? asks Sir Harry Melville

An economic and general assessment of the value of scientific and industrial research was given by Sir Harry Melville, secretary of the Department of Scientific and Industrial Research, in a talk to Manchester Statistical Society on November 8, in the course of which he paid tribute to the work of the Building Research Station, and the Forest Products Research Laboratory.

In the last financial year, he pointed out, gross expenditure on all the research stations of DSIR exceeded £7,500,000. But £300,000,000 had been saved on school building over the last 12 years as a result of the work of the Ministry of Education architects and building branch with the collaboration of the Building Research Station. "At first effort was mainly concentrated on single storey primary schools of open plan," Sir Harry went on, "presenting only simple daylighting problems. More recently demands for economy have led to more compact planning with lower ceiling heights and the development of the secondary school programme has

brought multi-storey construction to the fore, so that the problems of good daylighting design have become more difficult. The most recent development is that of permanent artificial, lighting to supplement daylighting and to permit even less expensive rooms to be planned acceptably. "BRS had also covered matters of heating and ventilation and the use of new systems of construction and materials. BRS was also responsible for introducing the tower crane to this country, and had studied its use in house-building in Norwich, which resulted in a saving of a thousand man hours and about £100 cost per house."

Sir Harry then turned to the work of the Forest Products Research Laboratory on kiln seasoning. "Under conditions of natural seasoning, timber stocks must be held in large quantities for periods up to five years," he said. "With the introduction of kiln seasoning stocks are held for only about one year. The consequent saving of working capital has been estimated as of the order of £40,000,000."

Sir Harry quoted the fact that £30,000,000 had been saved in the timber-using industry, thanks to new technology. "While the labour force of the timber-using industries between 1949 and 1953 remained fairly constant," he said, "the total net output of the saw-milling, joinery and furniture industries, taken together and revalued at 1949 prices, was £35,000,000 higher in 1953. This was the measure of the new annual net income generated by improved technology and new investment after the factor of inflation had been removed. Even after servicing the new capital investment at a notional rate of 10 per cent there still remained over £30,000,000 to be attributed to the originators of new technology and those who had the enterprise to develop it."

## DSIR examines wood chipboard industry

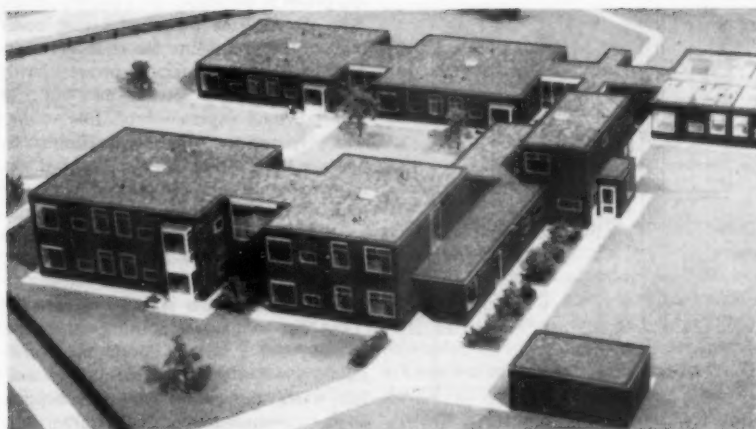
A long-term investigation of the problems of wood chipboard manufacture has been started at the Department of Scientific and Industrial Research's Forest Products Laboratory. It is being carried out at the request of the industry which is to bear most of the cost.

## TDA

### A timber engineering course

A weekend course in timber engineering from January 19 to 21 is being organised by the Timber Development Association at Westham House Residential College, Barford, Warwickshire. Inclusive fee for the course will be £6, and further information is available from the Midlands Regional Officer of the TDA, 55 Pershore Street, Birmingham 5.





## 5M CLASP

### MoHLG's first development project

This project, consisting of flatlets for 28 old people in Stevenage New Town, now under construction and currently on show at the Building Exhibition, has been designed by the recently-formed development group at MoHLG in consultation with the Development Corporation. It is significant not merely as the first of a whole series of development projects that we may now expect from the group, but also because it shows every sign of being the first successful attempt to apply the lessons of system building in the schools programme to the field of housing. This, of course, is basically a question of providing a set of components which can be assembled in a wide variety of ways, and therefore fundamentally different from previous attempts in this country at prefabrication, which have been limited to the repetition of a standard house, or at best a very limited series of type plans.

There were obvious advantages in the group's decision to undertake a revision of the CLASP system specifically for domestic buildings. The consortium already has a continuous and quite sig-

nificant programme of building to which such an adapted system can readily be applied, with such types as caretaker's houses, hostels and old people's homes. Equally, the consortium's existing organisation could be used for the bulk purchasing and advance ordering of components, whilst ensuring that demands placed on manufacturers would be co-ordinated so that all the advantages of mass production would not be diluted out of existence by any excessive demands for special components.

The group considered that the main problems of developing a reduced domestic-scale version of CLASP were to produce a smaller planning grid than the existing 3ft 4in. to achieve an overall cost which was comparable with conventional housing construction, and to raise the level of sound insulation for the internal partitions. At the same time it was considered desirable to develop a system which could be used together with the existing CLASP in a single building. Thus, for instance, existing CLASP could be used for the communal areas of a hostel, and the new system for bedroom wings.

## SfB (94)

UDC 725 · 56  
Homes for the aged

*Model of the project, showing the general layout in the form of a series of blocks around a court.*

The general characteristics of the system and method of assembly that the group have developed are in several ways similar to normal CLASP, with such features as box steel stanchions, open web steel beams, and external timber cladding frames faced either with timber boarding or, as at Stevenage, with vertically hung tiling. But there are a number of fundamental differences. The planning grid adopted is 1 ft 8 in, and this has given the system its name of 5M CLASP, ie five times the 4in. or 10cm international module. (The existing system will doubtless be known in future as 10M CLASP.)

At the same time a maximum span of 16 ft 8 in has been adopted as reasonable for the type of accommodation required. This has allowed a reduction in the structural depth of upper floors and roofs; in the case of roofs, timber deck units span up to the maximum of 16 ft 8 in, and this allows a considerable reduction in the amount of steelwork required, particularly in the case of single-storey construction.

Where internal partitions are party walls, they are formed of two skins of 3 in concrete blocks. This the group regard as only an interim solution to the problem of good sound insulation in what is otherwise lightweight construction.

By all these means, the group have achieved the target that they set themselves of reducing by 10 per cent the cost of structural elements in typical 10M CLASP. Further economies in comparison with the typical 10M CLASP school were, of course, possible because of the less expensive fittings and finishes required in housing. By such means the group were able to hit the overall target they had set themselves of a net cost of 60 shillings a square foot, as being comparable with conventional flatlets construction. This figure is a considerable achievement, bearing in mind the tendency for build-

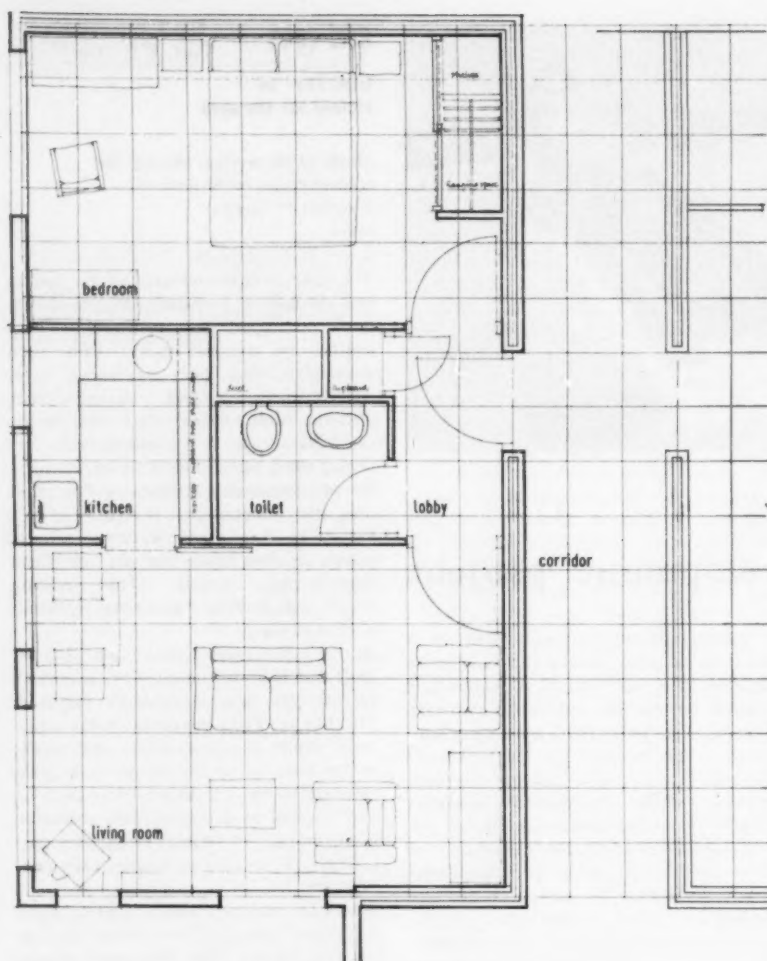


*Plan of project.*

#### KEY

- 1P single person
- 2P double flatlet
- 1 bed-sitting room
- 2 lobby
- 3 wc
- 4 kitchen
- 5 bedroom
- 6 living room
- 7 cloak
- 8 bathroom
- 9 shower
- 10 utility room
- 11 shared refrigerator
- 12 bin space
- 13 sitting space
- 14 warden
- 15 warden
- 16 common room
- 17 guest room
- 18 warden
- 1F first floor





Plan of two-person flat (grid lines at 1ft 8 in or 5M intervals)



Plan of single-person flat

ing prices to be higher than normal in the New Towns (see this week's cost comment, p1014). But one factor in compensation is that the general contractor, with whom the group negotiated and who has had previous experience of 10M CLASP, was prepared to reduce the preliminaries because the building could be carried out in five months, in comparison with say nine to twelve months for conventional construction. This in itself is a good pointer to the future of system building in housing.

The group are now starting to test 5M CLASP out on general housing, and hope to carry out a further development project in 1963 in this or a parallel system. But wider application will then depend on the co-operation of local authorities. MOHLG have expressed no views in the matter, but it is perfectly clear that if the CLASP lesson is to be applied to housing, it will be essential to set up some parallel organisation, a group or several groups of local authorities joining together of their own volition. It is very much to be hoped that at the right time sufficient authorities will see the advantages of pooling their resources, and come forward to participate.

The main task of the group was, of course, to study the needs of old people, and to use this as a basis for both planning and detailed design. The scheme consists of 24 single and four double flats, arranged as a set of five small blocks, three single-storey and two two-storey. Enclosed circulation space connects all the blocks to a central block, consisting of common room, quiet room and warden's house. In general the scheme follows the recommendations of previous MOHLG publications, that there is a case for groups of flatlets for old people, where they are provided with central heating, hot water, and enclosed circulation to communal facilities, while being able to call on the services of a warden in case of emergency or illness. Previous plans suggested by MOHLG, as for instance in *More Flatlets for Old People*,\* indicated that in these circumstances it was possible for wcs and bathrooms to be shared. This idea has been strongly criticised in the past, for instance in Chadwick's recent technical article (sfn (94): UDC 725.56, AJ 6.9.61) on the grounds that to share wcs was wrong in view of the fact that old people tend to be both immobile and incontinent. However, the group have in this case provided separate wcs for each flat, only the bathrooms being shared, thus removing any major grounds for this sort of attack. Indeed, by its pavilion planning, the provision of such features as the small sitting bays off the main circulation, and the detailing of fittings and equipment, the group have effectively proved the validity of this special type of housing. They stress that it is only one of a number of possible answers to the problem of old people; nevertheless they have been able to make a notable contribution to its solution.

\*HMSO, 1960



## REVIEW

### Building without architects

*The Principles and Practice of Town and Country Planning.* By Lewis Keeble. Published by The Estates Gazette, 3s 6d

Lewis Keeble has followed up his textbook on "The Principles and Practice of Town and Country Planning" with a review of current planning policies and their administration under the title of "Town Planning at the Crossroads." He has enjoyed a freedom rare among qualified planners to say exactly what he thinks, and to say it just as he pleases. One sometimes wishes he had used this opportunity to think more deeply and more systematically, and had disciplined his racy pen with a more discriminating sense of proportion, of purpose—and of syntax. But his robust common-sense and genially uninhibited style make this a book to be read.

To deal first with the shortcomings, Mr. Keeble has expressly tried to keep his legislative proposals within the limits of what might be acceptable to the present Government and prevailing climate of public opinion, yet the administrative burdens he would lay on planning authorities, national and local, would call for staff increases on a scale that is unthinkable in these circumstances. He airily dismisses the green belt (the one planning policy to which the Government is unequivocally committed and on which the public is wholeheartedly sold) as "a device that should be abandoned," without attempting to analyse its function.

Some architects may find equally contestable, if not detestable, his pronouncements on density; but these he does back up with cogent argument. He says, for example, that urbanity and subtopia have nothing to do with density and little to do with height. Urbanity, he suggests, is the effect produced by the anatomy of an efficient town plan, while sprawl is the effect produced by sporadic development and "snob zoning" at one to the acre, not by the 12-to-the-acre average that tends to result from any unprejudiced effort to mix dwelling types in proportion to household requirements and maintain decent standards of privacy and outdoor space. To quadruple this density, he points out, would be to reduce the distance between open country and the centre of a town of 60,000 people by about one-fifth, or a quarter of a mile.

The uncritical support given by many architects to the "disingenuous propaganda" of the National Farmers' Union on this subject is attributed by Mr. Keeble primarily to their feeling that they have been frozen out of planning. This, he thinks, has been due partly to their own "cold-shouldering" of opportunities to work in county planning offices, and partly to the failure of

private developers to employ them; and while he insists that the horrors prevented by statutory planning are "alone sufficient to justify the whole elaborate code of legislation and the large and unwieldy planning machine," he freely acknowledges that a high standard of design cannot be secured by public control of piecemeal private development, but only by the employment of architects to design it. Further, he declares that no authority should be allowed to exercise powers of control over the external appearance of buildings unless it has available to it expert architectural advice—as is now required in Kent.

"Although I think," he characteristically puts it, "that architects are often terribly silly about planning and talk much too much fearful rubbish about it out of ignorance, on this subject I am entirely with them." So much so, indeed, that he considers there is "everything to be said" for legislation making it compulsory to employ architects in connection with all building operations requiring planning permission. And he will brook no nonsense about employing only "good" architects on important buildings. To him "an architect is an architect": he goes so far as to assert that "when a building has been designed by an architect there can be no proper assertion that it is intrinsically a bad design, and public control can only be justified to the extent of ensuring that its relationship with its surroundings . . . would be happy."

It is on this point, in my view, that Mr. Keeble makes his most valuable contribution. Planning is judged, he argues, not by the horrors it has prevented but by the appearance of the development it has permitted. This, by and large, is poor, because it has not, by and large, been designed by architects; and until all development is designed by architects, the planning authorities can do little more than they are already doing to improve its appearance. But this is not to say that we should be just as well or better off without visual control: on the contrary, its abolition would have "abysmal effects" on the country's appearance, if only because it would greatly diminish the employment of architects. Nor is it to say that we should be able to dispense with visual control if we made it a statutory requirement that all permitted development should be architect-designed, for visual control has two functions. The first, to maintain a minimum standard of design, is made necessary only by the absence of such

legislation. But the second, to see that all permitted development is satisfactorily related to its present and future surroundings, would remain vitally necessary even if all permitted development were architect-designed. And this, the proper function of visual control, can be properly discharged in a democracy only by an elected body of laymen advised by a qualified architect.

DEREK SENIOR

## BUILDING CENTRE

### Architect and GPO

A discussion forum on "the architect and the installation of telephones" was held at the Building Centre recently and was opened by W. Pack, of Elsom & Partners, who made two main points. Firstly, when GPO wiring is installed during the course of a building contract the GPO are not, and cannot be treated as specialist sub-contractors but have ways of their own which sometimes lead to administrative difficulties.

For instance, although Mr Pack has never so far been let down by the Post Office, he has never received any specific assurances from them that they would be able to finish by the requisite date. Further, there was a real need for a "co-ordinator" to be appointed for each building since several departments of the GPO might be involved, and it is difficult for the architect to know whom to contact with a particular query.

Mr Pack's second point was to wonder whether the large office buildings now being erected on the outskirts of towns will not place greater demands on the distribution system than it can bear. Formerly developments of this kind were confined to the centres of cities, where there is no particular problem, but with the tendency towards dispersal he foresaw trouble.

The GPO representative present was not particularly helpful. In fairness it must be said that he had been called in at short notice to deputise for G. Turner, who had fallen ill, and did not know very much about telephone provision for large buildings, nor what happens on the site. Having admitted all this, it must also be said that his general knowledge seemed somewhat deficient. He appeared to resent the fact that columns are placed round the perimeters of buildings as they interfere with the run of skirting trunking, and said that the GPO could not be expected to specify a particular size of duct for their cables to run in—they could only give the size of hole through which the cable would pass and it was somebody else's job to decide what size duct was necessary to give a clear run.

He was able to give quite a lucid explanation of how the GPO is organised, but it never seemed to occur to him that this organisation might be capable of improvement. Nor did he think that a "co-ordinator" could, or should, be appointed, and so on and so on. . . .



## CO-OPERATIVE PARTY

### Guide to housing co-operatives

The Co-operative Party has followed up the decision of the Minister of Housing, under the Housing Bill, to set aside £25,000,000 as a pump-priming operation to help finance non-profit-making housing associations, by producing a pamphlet, *Housing Co-ops and Local Authorities* (Co-operative Party, 54 Victoria Street, London SW1, 1S), written by Harold Campbell, the party's assistant national secretary, which explains the workings of a housing co-op (a well-established method of building for use instead of profit on the Continent, but much neglected here), and gives practical information on the powers of local authorities to promote and assist housing associations, by acquiring land, making loans, and guaranteeing the loans an Association makes for itself, with some examples of Associations which Willesden Borough Council has enabled to buy blocks of flats for their members.

It goes on to describe the very successful development of housing co-ops in Sweden, Denmark and America, and concludes by urging that a powerful nationwide organisation, modelled on those which promote the tenants' co-operatives of Scandinavia, is needed here, to popularise the idea of tenants' co-ops, to persuade local authorities to use their powers fully, and to "mobilise enough financial resources to ensure that approved co-operative schemes get off to a good, safe start." The existing Co-operative Building Society and Insurance Society, it is suggested, "may very well be able to offer the kind of backing that is needed. But if the Government meant what was said in the Housing White Paper about encouraging more houses to let, something will have to be done about sky-rocketing land values, which could prevent tenants' co-ops being able to build for letting at economic rents."

## IME CONVENTION

### Planning for traffic

When the Doncaster bypass was opened this year, traffic entering the town from the north was expected to decrease by 34 per cent: actually it went down by only 19 per cent. This disconcerting fact is being explained in terms of a "frustrated car usage factor"—which may be right, but raises the question how many millions must be spent on the relief of this particular frustration.

This was one of the points of interest which came out when, for the second year, the Institution of Municipal Engineers organised a one-day convention on a subject of popular interest, "Planning for Traffic," in addition to its annual conference. Designed to attract the attention of the national Press, this year's convention certainly succeeded in its object.

The four papers on the theme presented, which fill 48 handsomely printed pages, contain some interesting facts about traffic growth (they show how abysmally the Ministry of Transport has underestimated traffic growth in the past); about the percentages of employees in new shops and offices in Bradford who drive to work in cars; and about the degree of overloading, in terms of the M.O.T. capacity standards for roads of various widths, to be expected in the future on the roads of Lancashire and Nottinghamshire. One of the papers was by the Chief Civil Engineer of British Railways, C. W. King.

Several speakers stressed the importance of public transport in the solution of urban traffic problems. Mr John Hay (Joint Parliamentary Secretary, M.O.T.) said the ministry wanted to encourage thinking on transport as a whole. The movement of road vehicles was, he stressed, only one of the things necessary to civilised urban life; our task was to find "efficient and acceptable means of moving goods and people around."

Mr J. Rawlinson (Chief Engineer, L.C.C.) referred to the 1948 proposal for an "A" ring motorway 11 miles long, encircling central London, the line for which was not held because the Government of the day thought the scheme was too expensive. The chairman of the R.A.C. criticised the Nugent Committee's "anaemic reference" to this project. But Mr Edmonds (Chairman, L.C.C. Highways Committee) pointed out that the proposed "A" ring would be very destructive of amenities and homes; and even Mr Rawlinson had a "word of caution" to offer about the

limitations of ring roads.

There were other indications that the engineers do not really know with certainty how urban traffic problems can be solved without ruining our cities, however much money is spent. For instance, one of the papers contained this passage: "... there still remain many decisions to be taken on basic matters. Such decisions are fundamental and of national application. . . . It must be decided to what extent the motor-car is to shape our cities of tomorrow, which will embrace the answer as to the circumstances to justify two-level construction through urban areas. It is necessary to decide the standards of construction and layout for such roads and the place of the urban ring road must be defined."

An even more questioning note was sounded by the deputy engineer for Nottingham, who claimed that it made little sense to build six-lane thoroughfares feeding into roundabouts of the size being built today. He advocated gyratory systems some 300 to 400 ft. in diameter, with buildings in the middle and subways for pedestrians.

The Borough Surveyor of Chelmsford spoke of a "Parkinson's law" of traffic, which says that traffic expands to fill the space made available for its use. Doncaster's traffic increase is a good example of this.

It was good to hear Mr Brunner, speaking for the British Road Federation saying that landscape architects should be included in all design teams working on new road projects.

NIGEL SEYMER

## NW METROPOLITAN HOSPITAL BOARD

### More architects for larger programme?

The establishment committee of the North West Metropolitan Regional Hospital Board has asked for the regional architect's department to be increased again because of the increased programme of work since last year. Then it was envisaged that the capital programme would be at the rate of £3 to £4,000,000 a year; now the Board's ten year programme has been submitted to the Minister for approval and it looks as if capital expenditure over the next 10 years or so will reach £65,000,000, plus forward planning on schemes amounting to another £15,000,000.

The report suggests that about 60 per cent of this programme be undertaken by private architects, but points out, "allocating schemes to private architects does not of course relieve the department of responsibility for them and it is estimated that about 12½ per cent of the department's staff must be available to work with private architects on schemes being designed by them." In addition to this the regional architect

expects the department to handle up to £2,500,000 worth of problems designed in the department, and "it is necessary that research into methods of construction, which has already begun, should be continued with a view to achieving economies in hospital building."

The Establishment Committee therefore put forward the proposal that the department be ultimately increased by three assistant regional architects, four principal assistant architects, 23 senior assistant architects, and three sub-professional staff. This would be accompanied by a reduction of 10 in the assistant architect and architectural assistant grades, and would result in the department comprising four architectural groups, each headed by an assistant regional architect with two principal assistants, one working on the major project of the moment and the other on the smaller problems in the group's programme. In addition to these four groups, one regional architect is required to direct research into current building design.



The Committee point out that recruitment of assistant architects is "virtually impossible" at present owing to competition with other authorities and private architects, and therefore suggests that the main body of staff should be recruited in the senior assistant architect grade.

## Architects to visit hospitals abroad

In another report, on Research Study Travel, the Board's Establishment Committee says that ten of its senior architects are to go on tours of hospitals abroad in the coming year. "With the projected building and major reconstruction of hospitals, it is considered of great importance that every opportunity should be taken to study new developments in architecture abroad."

The committee believes that there is a great deal to learn from Germany, Switzerland, France, Italy, Spain, Belgium, Holland, Scandinavian countries, and possibly from east Mediterranean countries such as Israel, and the regional architect has drawn up a tentative programme covering visits to these countries over the next three years.

Study leave is to be granted up to an aggregate of about 1 per cent of the professional manpower time of the department—ie, six months' total study leave among 50 architects, and the cost of the programme over three years is estimated at £4,000.

## ELECTIONS

### National Joint Consultative Committee

The first meeting of the new session of the National Joint Consultative Committee of Architects, Quantity Surveyors and Builders, at the RIBA on October 16 elected Cyril Sweet, FRICS, senior partner of Cyril Sweet & Partners, as chairman, Sir William Holford as vice-chairman for the year.

New members of the Committee were E. C. Strathon, president of the RICS, Alick Low, FRIBA, Dan Lacey, Roger Walters, and Michael Simpson, who is chairman of the Junior Liaison Committee, which is henceforth to send an observer to the NJCC.

It was announced at the meeting that the NJCC had set up a committee to consider ways of developing joint training and education for the professional and contracting sides of the building industry, and that Sir Noel Hall—now principal of Brasenose College, Oxford, and former principal of the Administrative Staff College, Henley—had agreed to act as independent chairman. Representatives to serve on this committee have been nominated by the RIBA Board of Architectural Education, the Board of Building Education, the Royal Institu-

## RSA LECTURE

### Solar energy for domestic heating

The principal of Woolwich Polytechnic, Dr Harold Heywood, who is also a member of the Association for Applied Solar Energy in the United States, gave an interesting lecture to the Royal Society of Arts on November 9, on the part that solar energy could play in providing, in particular, cheap hot water, if integrated into the overall design of heating services.

Pointing out that energy consumption and national income are closely related, and energy requirements are increasing at the rate of 10 per cent per annum, Dr Heywood said that if the supply were to be doubled every 10 years the increasing cost of power might promote the use of direct solar radiation as an auxiliary means of water heating, because of the increasing cost of power.

Before a proper assessment of the possibility could be made, more research is needed on the radiation received by surfaces in various positions, so that optimum positions could be determined for various seasons and localities; research of this kind is being carried out at Woolwich Polytechnic, and in an increasing number of research stations throughout the world.

From the architect's point of view the most interesting part of the lecture was that outlining the principles of solar radiation collectors, which can be divided into two groups, one in which the absorbing surface is fixed and collects and diffuses radiation without concentration, and one in which a system of mirrors concentrates the radiation, rotating to follow the motion of the sun. At this stage of development, collectors in the first group are of more immediate

interest, and Dr Heywood concisely described the principles involved, and the effectiveness of solar absorbers with different coatings.

He went on to give some calculations of savings in electricity costs, based on experiments at Kew Observatory which showed that the equivalent of three therms per sq ft per year is received as radiation, of which about two therms can be collected as heat: on the assumption that electricity costs 2s 6d a therm, the annual heat value per square foot of roof would be 5s, and a 40 sq ft heater should save £10 in electricity cost a year. Since present solar heaters are estimated to cost 15s per square foot, and to have a life of "at least 10 years," the resultant saving for a small house does not seem very important, in this country. But in sunnier countries, and Dr Heywood quoted Israel (where solar water heaters are in use at some hospitals), Japan and Arizona, their value could be much greater.

It would seem that in the field of tropical architecture a much closer study of the possibilities should be made, and could usefully be included in post-graduate courses on the subject.

In the discussion which followed, it was reported that a house has recently been completed in North Nottinghamshire using a solar heater, warming tank and hot water cylinder with thermostatic control to heater and hot water cylinder, on which tests are to be carried out and data published, and two examples of outdoor swimming pools heated by solar collectors were mentioned.

tion of Chartered Surveyors, and the Institution of Structural Engineers. These bodies will be represented respectively by: Edward D. Mills, CBE, William Allen and Denis Harper; H. S. Oddie, P. M. Shepherd and Professor A. W. Hendry; W. James and A. J. Culley; and L. E. Kent and D. T. Williams.

## NW CIVIC TRUST

### Tidying up "the world's dullest, drabdest, and dirtiest industrial area"

A Civic Trust for the North-West was inaugurated in Manchester in October, which is to conduct face-lifting operations under the direction of Lieut.-Col. J. M. Barton, with Professor Denis Harper acting as consultant.

Its aim, according to the chairman, W. L. Mather, is to turn what he des-

cribed as "the world's dullest, drabdest, and dirtiest industrial area—that centred on Manchester and Salford" into an attractive, healthy and stimulating region. Nine local industrialists have been persuaded to guarantee £500 a year each to pay a full-time staff, and the area they intend to improve stretches from Preston to Macclesfield, excluding Merseyside.

Lovers of the heroic North will be relieved to know that the new Civic Trust recognises that what is good for a south country market town may not be suitable for the industrial north-west. Mr Mather told a lunch party of heads of local authorities, "We believe we should have a style of our own representative of the dynamic qualities of our great manufacturing area. There is a powerful beauty in a pithead and an elegant strength in a cooling tower." All that was needed was decent surroundings instead of waste land and slag heaps.

He also wanted the Trust to help prevent the neglect of Lancashire's Victorian buildings.



## COMPETITIONS AND AWARDS

### RIBA Bronze Medals

The jury appointed by Norfolk and Norwich Association of Architects have made their award in favour of the offices designed by Fry, Drew & Partners for Dow Agrochemicals Ltd. at Kings Lynn.

The jury of the Devon & Cornwall Society of Architects have made their award to St. Austell Branch Library, designed by Cornwall's county architect, F. K. Hicklin (which was subject of a Building Study in AJ 16.8.61).

### Civic Trust

Civic Trust Awards for 1961 will be for work done in London, and will cover schemes completed between May 31 1958 and May 31 1961 within the area covered by the LCC. Two classes of entry are invited: Class I, new buildings in the design of which respect has been paid to the character of the neighbouring buildings and natural surroundings; class II, schemes of other kinds for improving the appearance of the urban scene. There will be one award in each class for each Metropolitan borough. Entries must be submitted to the appropriate town hall—from which entry forms may be obtained, not later than December 31 1961. Further information is available from the Civic Trust, 79 Buckingham Palace Road, London SW1 (Tate Gallery 0891).

### Rome Scholarship in Architecture

In addition to the Rome Scholarship, the award of which has already been announced, the Faculty of Architecture of the British School at Rome have awarded a special scholarship of one year's duration to the "Proxima Accessit" in the competition, Mr C. H. Bosel, Barch (Queensland).

### Farm buildings

The Country Landowners Association is offering £450 in prize money in its second National Farm Buildings Competition, the subject of which is Ware Potato Storage on the farm. The subject has been chosen to focus attention on the increase of indoor storage and bring to light the best features of existing designs.

There are two classes: 1, for new buildings or conversions for ware potato storage with permanent thrust-resisting walls; 2, for multi-purpose buildings used for ware potato storage with or without permanent walls.

The judges appointed are: Peter T. G. Twiss, of the Agricultural Research

Council, W. G. Beney, ARIBA, and Bevington Burt, a large-scale potato grower. Closing date for entries is January 5, 1962, and the competition is open to all potato growers in England and Wales, tenant farmers, owner-occupiers or designers of the required type of building. Entry forms and details are available from L. W. Gee, The Country Landowners Association, 24 St James's Street, London SW1.

### Urbanisation in Spain

An international competition of ideas for the urbanisation of the valley of Asua, Bilbao, has been approved by the International Union of Architects. The organisers are offering a first prize of 1,000,000 pesetas (£5,882), and a second prize of 500,000 pesetas. Closing date for entries is May 1, 1962.

Applications for entry should be made before December 1, 1961, and application forms are obtainable from the Concurso Internacional del Valle de Asua, Ayuntamiento de Bilbao, Bilbao, Spain.

### Design in plastics

Arborite Ltd are holding a design competition with awards in three categories: 1 Furniture design using laminate surfaces

2 Architectural design, using laminate surfaces

3 Graphic design for a laminate pattern. In each category there will be a first prize of £100 and four runners-up awards of £20 each.

Judges will be: Sir Basil Spence, RA, RDI, PPRIBA, Professor R. D. Russell, RDI, FSIA, Professor R. Guyatt, HONARCA, Philip Sanford, director of the Arborite Company (UK) Ltd, H. L. Johns, marketing director, and N. Eldridge, art director of Waddicors.

Details and entry forms are available from The Arborite Company (UK) Ltd, Bilton House, 54-58 Uxbridge Road, London W5.

### Michael Ventris Memorial Fund

The Michael Ventris Memorial Fund, founded in 1957 in memory of Ventris's work in the fields of Mycenaean civilisation and of architecture, provides an annual award (ordinarily of £100) alternately to promote the study of Mycenaean civilisation, and for the study of architecture: this year's award will be for a study of architecture, and applications for consideration should be sent to the Secretary, Architectural Association, 34-36 Bedford Square, London WC1, not later than February 1, 1962.

Applicants should give particulars of their age, qualifications, academic record or other evidence in support of the application, with the names of two referees, and should outline the work they would like to pursue if the award is made to them.

Awards are made by an Advisory Committee appointed by the Institute of Classical Studies and the AA acting jointly.

### Trade and technical literature

The RIBA has just announced its fifth trade and technical literature competition, sponsored jointly by the Building Centre. Once more it has as its objects "to recognise excellence . . . to persuade manufacturers . . . to increase the technical and informative content of their literature . . . to encourage manufacturers to produce trade literature to the international A4 paper size . . ." and "to encourage the preclassification of trade literature on the international sfb udc system."

The jury this year, nominated by the president of the RIBA, consists of George Grenfell Baines, Andrew Derbyshire, R. T. Walters and Bryan Westwood; it has power to co-opt members from other branches of the building industry. Copies of the conditions and entry form are available from the Director, The Building Centre, 26 Store Street, London WC1, and all entries must be received at the Building Centre by midday, April 30 1962.

### Aeropreen

The 1962 Aeropreen award for upholstered furniture designs is subject to no age limit this year. Entry forms and details are available from the Secretary, Aeropreen Award Committee, Lindsay Avenue, High Wycombe, Buckinghamshire. Closing date for entries is February 10 1962.

First, second and third prizes of £300, £150 and £50 will be awarded and the assessors are: Ernest Race, RDI, FSIA, F. J. Bristow, past president of High Wycombe Furniture Manufacturers' Society, G. F. Cole, F. H. K. Henrion, MBE, RDI, FSIA, and Sylvia Reid, ARIBA, FSIA.



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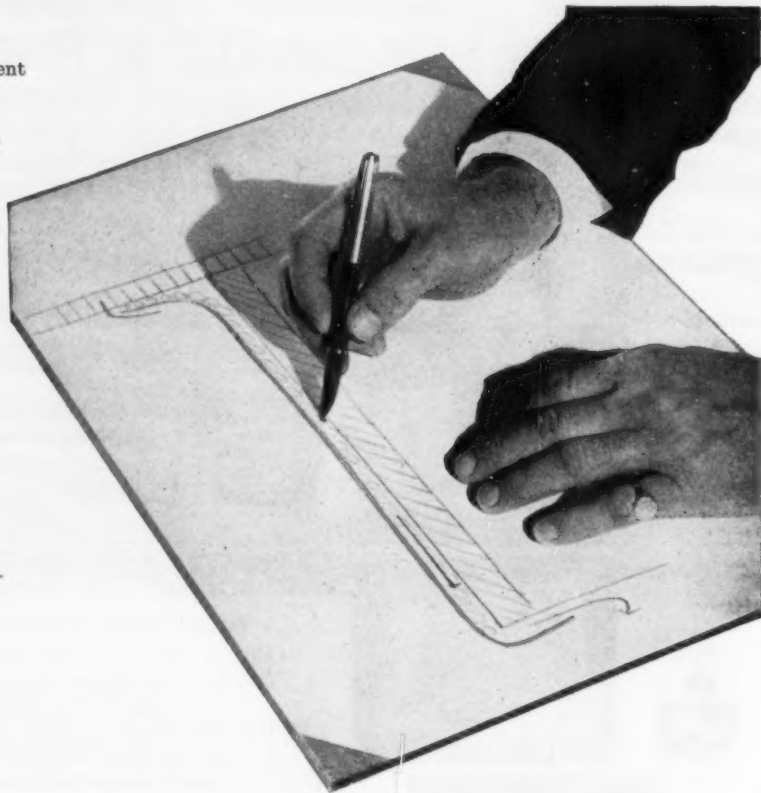
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# architectural education

Editor of this supplement: Paul Ritter

The Architects' Journal (November 22 1961) 991

## Change in panel policy

After some six months of existence, the Architectural Teachers' Panel, which has been producing this supplement, met in October to discuss its future.

The initial aim was to provide a medium for the interchange of viewpoints and experience between teachers of architecture and all those in the profession with an interest in architectural education. These first steps have now been achieved, thanks particularly to the initiative and continuous efforts of G. P. W. Taylor and the ready response of the AJ itself. There is now regular contact taking place between teachers of architecture in a number of schools and the supplement has provided a means whereby the content and method of architectural education can be more fully explored.

In considering the future of the supplement, the panel felt that the expression of a more definite editorial viewpoint might result in the supplement making a stronger impact. It has therefore been decided to entrust the production of the supplement to a Working Group consisting of:

Edward Curtis

Paul Ritter

Stuart Sutcliffe

The panel also felt further possibilities of a more long-term nature should be explored.

In the whole sphere of university and higher education there are many organisations which bring together teachers and research workers under their different subjects, acting as generators of further progress and development. These "faculty" organisations are not only concerned with the teaching of their subjects but also with the dissemination of advanced work and the publication of the results of research work done in the universities. Often such faculty organisations are prominent in editing quarterly journals many of which have become known far outside their immediate sphere.

In the field of architecture in Britain, however, there is no organisational link between staffs of schools other than the Royal Institute itself.

As the volume of research work done in schools of architecture grows, and its quality improves, the problem of the lack of adequate means for the publication of a great deal of valuable material may become acute.

There is still plenty of room for the extension of communication between architectural teachers and research workers through conferences, seminars, symposia and study groups.

The Architectural Teachers' Panel has therefore set up a further working group to examine such long-term possibilities as the formation of a faculty-type organisation for teachers and research workers in schools of architecture, the publication of a quarterly journal of an academic nature, the organisation of regular seminars and symposia on specific topics and the possible organisation of a conference in 1962.

The working group which will be examining these long-term questions will consist of:

Peter Cowan

Anthony Goss

Brian Hitchcox

G. P. W. Taylor

Newton Watson

Further co-options may be made to this group.

This working group would like to hear from other staff in schools of architecture who might be interested in any of the long-term possibilities which it will be examining. They should write to: Anthony Goss, Birmingham School of Architecture, Margaret Street, Birmingham 3.

We should also like to thank those who have contributed to the AJ supplement and invite further material.

ANTHONY GOSS, CHAIRMAN, ARCHITECTURAL TEACHERS' PANEL

## Letters to the editor

### TWO TRENDS

SIR: I should like to correct some of the statements made by Anthony Goss in his article, "The Two Trends Contested."

(1) Nowhere in my original article did I refer to *the* two trends, as if they were the only ones that mattered. Neither did I postulate two opposed camps in architectural education. This is not a battle between black and white! Two conflicting trends may occur as much in an individual as in a group.

(2) If Goss were familiar with the works of A. S. Neill (this is the correct spelling, by the way) he would be acquainted with the distinction Neill clearly draws between *freedom* and *licence*. It is untrue to infer that there are no rules and no courses of study to be followed at a Neill-type school.

I am indeed aware of the "actual course at present in operation at one prominent school of architecture," and only a cut in my original draft necessitated the omission of a reference to Professor Llewelyn Davies and his philosophy of education,\* now bearing some results at the Bartlett School.

In view of Goss's final remarks, I should like to quote Professor Davies who, referring to the lessons of the Bauhaus, states that "we must . . . consider how best we can free students from the things that stop them being able to design" (my italics).

HARRY CHADWICK  
Nottingham

\**The Education of an Architect*, RIBA Journal, January, 1961

### NEW COURSE

SIR: Paul Ritter's explanation of the experiments at Nottingham in the teach-

ing of "theory and practice of building" raises doubts in the mind of one, at least, who is concerned with these problems in another of the recognised schools.

The course at Birmingham has, in the past, been criticised for its unorthodoxy—for attempting to impart technical knowledge and skill by actual site contact with materials and techniques. Even so, we have found it impossible altogether to dispense with a "stiffening" of formal lecture instruction in these subjects, if only to impart a full and proper "vocabulary" in the mind of the student.

Mr Ritter blandly observes that the increasing volume of knowledge cannot be covered in courses of lectures during the five years of the course. I contest this, if by knowledge is meant a grounding in the full range of materials and components available and guidance to the student's judgment in using them



appropriately. Admittedly, the lecturer must be at pains to keep abreast of the many developments taking place.

I should have preferred to see some reference to this problem between items 5 and 8 of the "new course!" I applaud the way in which Nottingham students are made aware of the problem of classifying the information they receive, though I feel it hardly deserves the emphasis given to this aspect.

I should also have been interested to read more about the encouragement of cost consciousness and how it is possible to inculcate this by field studies.

R. STANLEY MORGAN  
Birmingham 23

*In saying that the increasing volume of knowledge cannot be covered I speak from nine years personal experience as teacher, five as student, and after research. Others of far greater distinction also hold these views. Field studies carried out in collaboration with the architects do lend themselves to learning about cost. It should be understood that the report of the Nottingham course was a personal one.*—PAUL RITTER.

## The new policy

The Working Group have in common the belief that there are urgent, specific needs in architectural education. There can be no complete agreement on what these needs are. But the Working Group will work out a clear policy.

To facilitate production members will take it in turn to edit the journal, singly or in twos. It is agreed that the name of the editors shall appear on each supplement so that the panel need not be identified with the particular issue.

## Every school should have at least one heliodon

by C. J. Millard

The study of light is supremely important.

The heliodon is by far the most efficient way of studying the effect of light on the exterior, interior and surroundings of buildings.

Heliodons are basically divided into two kinds. In one the base (the earth with model) moves. In the other the light source (the sun) moves. But both base and light source can be variable.

There are posh ones, but a simple one can be made for less than the cost of one drawing board. This model is easy to use and difficult to spoil and it should be in every school of architecture to get students used to the continual use of it, as a matter of course.

The heliodon becomes a tool of design. It's a very useful tool. Not just for diploma projects, not just in set exercises, but as a matter of course in every suitable context in every year. It allows a very quick way of recording effects.

Photography is best. Students should have a cine-camera and an ordinary camera with which to record and the facilities for developing without commercial expense.

The photograph is an important means of communication. Students should have full opportunities to get to know it.

A heliodon should be in every office. It is not. But a succession of students trained to use it will change this situation.

S. Shelley of the Department of Health for Scotland has invented a particularly simple model which uses a normal light source. The model has been used in the design of housing for Cumbernauld. The evidence it gave was very useful.

### USE OF HELIODON, YEAR I

*Insolation Study, Year I, Nottingham School of Architecture, by R. Fox and D. J. Harvey*

*Park Hill Flats, Sheffield. Final Report*

*The study is confined to the play and circulation areas, shops and school playgrounds*

*Analysis of the shadows recorded under the heliodon (from students' report)*

*Summer (heliodon set at June 22)*

At this time, with the sun at a maximum angle of elevation, all areas receive an adequate amount of sunlight. During the summer months, especially between July and September when the schoolchildren are on holiday, the play areas are used most. Thus the fact that by 6pm two-thirds of them are still sunlit means that the children and old people will have plenty of opportunity to be in the sun.

The shops and school are also in sunlight during the hours in which they are in use (ie 9am-6pm).

In the evenings the only areas sunlit to any great extent are play area 1 and the garage play-areas, and there may be a tendency for the children to congregate there.



*Heliodon designed by Mr. Shelley*



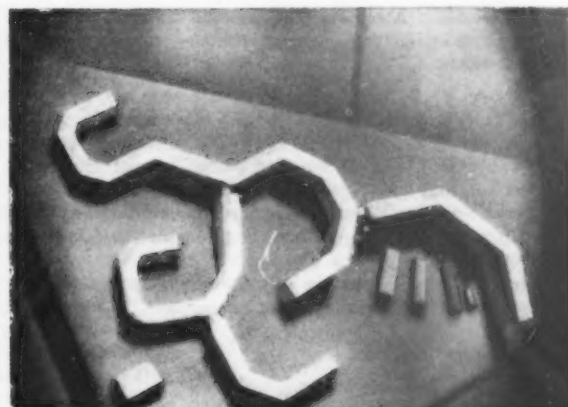
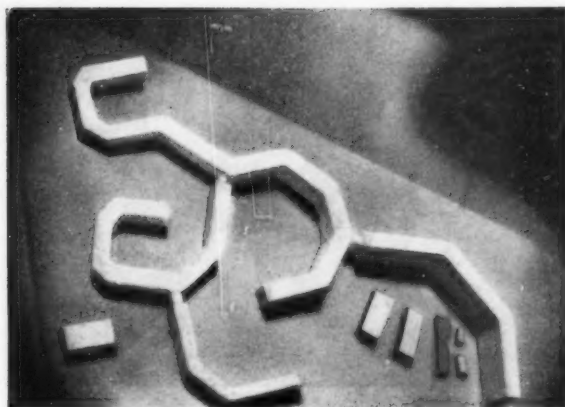
*Heliodon at Bowcentrum, Holland*

*Spring and Autumn (heliodon set at March 21 and September 23)*

At this time of the year, play-areas 2, 3, 4, are wholly or partially obscured by 2 pm (the shops also), and the school playground by 3.30pm. At 4pm only play-areas 1 and 5 are sunlit.

What effect this will have on the various areas has yet to be





*Park Hill: These photographs were taken at two-hourly intervals for midsummer, midwinter, and equinoxes. Left, June 21, 2pm; right, June 21, 4pm. Play areas 1 and 5 are in the two lower courts, opening on right*

seen. The lack of sunlight in the shopping areas during the afternoon could mean increased use of artificial lighting, and may discourage window shopping to some extent. During these months, however, the sun is often obscured by cloud, so the presence of shade in many of the areas may not be so important.

#### *Winter (heliodon set at December 21)*

At this time the amount of sunlight received on the play-areas

is very small, and the inner faces of the north-facing blocks receive no sun at all. In general the sun only penetrates to those areas open to the se, s, and sw.

The shops and school are in shadow from 10 am onwards, meaning that they will be artificially lit for most of the day. The fact that the play-areas are in total or partial shade throughout much of the day is not so important as in summer since the weather will often be too bad to encourage people to stay outdoors for any length of time.

#### USE OF HELIODON, YEAR V

The heliodon used was an inside-outside type, built from information supplied by the School of Architecture, University of Kansas.

*Scheme:* Diploma Project; Leonardo da Vinci Museum, by C. J. Millard, Nottingham School of Architecture.

*Site:* West side of Piazza della Signoria, Florence.

*Building:* Hemmed in on three sides to such an extent that light openings in the walls would be useless for the illumination of exhibits.

*Aim:* Natural illumination of exhibits with secondary artificial lighting.

*Nature of light:* Strong sunlight with maximum sun elevations of: 69° Summer and 46½° Winter. Strong shadows.

*Problem:* To bring light to exhibition galleries at many different levels throughout the building.

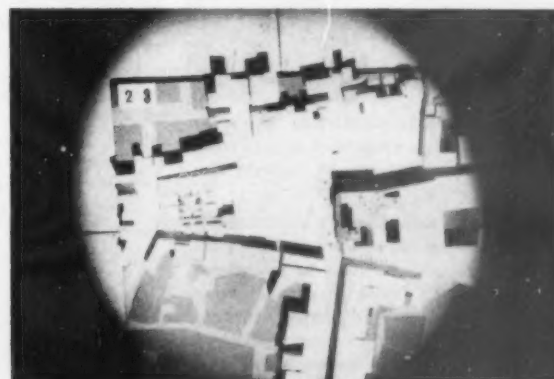
*Solution:* High level openings in the roof of the building with shafts penetrating through the buildings to the exhibition levels.



*Fig 1 General view of site model. Museum is in background and to right of tower*



*Fig 2 Sunlight on site June 21, 9am*



*Fig 3 Sunlight on site June 21, noon*



*Use of heliodon:* Accepting the "solution" to the problem as being the most likely to succeed; heliodon studies are based on this premise.

Figs 1, 2, 3, 4

*Exterior use*

(a) Small-scale model of building placed on site model. By observation and photographic recording it was possible to determine which galleries received sunlight, the length of time that direct sunlight entered them and roughly the hours that light entered and left the gallery.

(b) Observation of the way in which the building cast shadows on the surrounding buildings and vice-versa.

Figs 5, 6 and diagram

*Interior use*

(a) By using a large-scale model of a section through a typical exhibition gallery, observation of the manner in which sunlight would move through any gallery throughout the day.

(b) Using the same model as above, observing the way in which walls, floors and ceilings when treated with different textures can modulate the light entering the gallery.

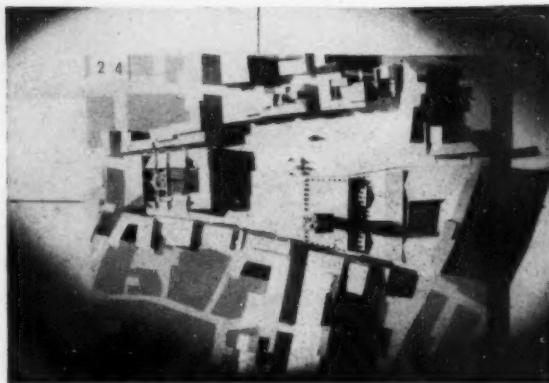
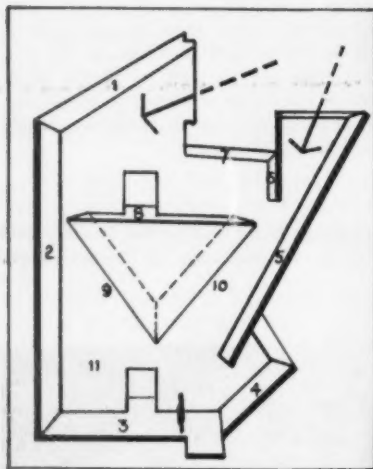


Fig 4 Sunlight on site June 21, 5pm

These tests determined the final form of light openings and the treatment of the interior of the exhibition galleries.



*Diagram*

Vertical model section through typical gallery. All surfaces, walls, floors, ceilings were duplicated and treated with different textures in order that any combination of surfaces could be experimented with. Two examples are shown right. Arrows indicate the light source. The figure indicates the scale: The scale of original model was  $\frac{1}{2}$  in to 1 ft



Fig 5

- 1 Highly polished surface
- 2 Matt surface
- 3 Highly polished surface
- 4 Polished surface
- 5 Highly polished surface
- 6 Matt surface
- 7 Polished surface
- 8 Highly polished surface
- 9 Highly polished surface
- 10 Highly polished surface
- 11 Matt surface

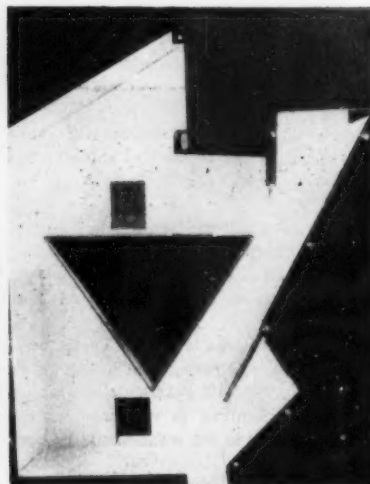


Fig 6

- 1 Highly polished surface
- 2 Textured surface
- 3 Polished surface
- 4 Matt surface
- 5 Matt surface
- 6 Matt surface
- 7 Highly polished surface
- 8 Polished surface
- 9 Highly polished surface
- 10 Highly polished surface
- 11 Heavily textured surface



## Medical education criticised

Architects believe that their education is in a bad way, in comparison with other higher education, but it is ahead of many forms of higher education. Awareness of the inadequacy of what remains authoritarian and traditional is widespread.

Medicine is a case in point. The following quotations are remarkably close to trends of thought in architecture. At the World Health Organisation conference of the European region, Dr John R. Ellis said, as reported in *The Times* 25.9.61: "Medical education had been weakened by attempts at comprehensive coverage. Undergraduate students had become progressively less able to think for themselves and at the same time efforts to teach them everything had been redoubled in the conviction that safety lay in this direction. Thus a vicious circle had been established. This could now be broken only by the deliberate acceptance of new educational objectives."

Three days later in *The Daily Telegraph*, Jonathan Fearnley said "a radical revision of our whole concept of the scope and purpose of medical education is becoming a matter of urgency" and Mr Fearnley criticises the status quo, "For the first two years they will laboriously dissect the whole body, learning anatomy in the same relentless detail. They will follow the same biochemical 'experiments' to the same foregone conclusions. The emphasis throughout is on facts and a good memory rather than ideas and a creative mind." "... the whole question of the relation of medicine to the social problems of today is badly neglected." "... there is an unavoidable tendency for the student to see medicine as a series of unrelated parts rather than an integrated whole."

Dr Ellis enumerated what the medical student needs to acquire (and this is true for his architectural counterpart): "1. Acquisition by the student of the power to learn for himself; 2. the acquisition of a scientific method of thought, ie the power to reason and to think critically; 3. the acquisition of competence in clinical method—the technique of obtaining information from patients; and 4. an understanding of the responsibilities of a professional person."

The most important lesson we can learn from the doctors lies in the warning not to divorce the "pre-clinical" period, preliminary three years (didactic) from the "clinical" period (the design period, last two years) as is policy at the Bartlett. To quote Fearnley, "First, there should be no such thing as a strictly 'pre-clinical' period. Although the first two years may still be mainly devoted to the study of normal human structure and function, contact with the teaching hospital should be established early." "... the general policy of integration should hold right through the course."

Recommendations for the form of the whole course in medicine are again strikingly parallel to those made in architecture.

"The undergraduates' curriculum should cease to be a timetable into which all subjects were squeezed. Instead, it should become a series of consecutive stages of learning, in some of which the student had a choice of subject" (Dr Ellis). "Are these recommendations practical? They have in fact already become part of the schedule at the Western Reserve University, Cleveland, Ohio. Their scheme of integration was begun as a bold experiment in 1952, and the results have been encouraging" (Fearnley).

Medicine and architecture are at the dawn of an entirely new attitude to further education, the same can be prophesied for all departments.

Such a transformation is not a matter of revolution. Such things cannot be forced. They take time. They can best be nurtured opportunely: helping progress with all one's energy where the capacity to change and improve exists. And the rate of change should be adjusted to the capacity of teachers and students. A system with greater freedom merely gives more opportunity to enjoy work untrammelled by irrational interference.

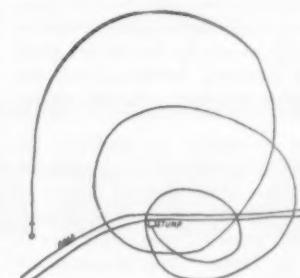
The first lesson of many students in further education may be to learn that work can be liked and longed for as enjoyable, and an end in itself. This lesson is not just for student days, not just for life, but for the gradual transformation of our culture pattern in which the love of work is taboo. We train the young to "hate work" by making them do that which they do not like and calling it work. And when they hate it we engrain the feeling by making a moral issue out of it "you ought to." So most of us live more or less in the horrible ambivalence of hating what we might love, and not able to love work because of compulsive hate. What Aldous Huxley says applies to our attitude to education:

"In earlier times, when the rate of technological and demographic change was slow, societies could afford the luxury of their collective neuroses. Today political behaviour dictated by obsessive memories of the past (in other words by venerable traditions that have lost their point, and by old, silly or actually diabolic notions raised to the level of first principles and canonised as dogmas) is apt to be fatally inappropriate." (*The Observer* 22.10.61.)

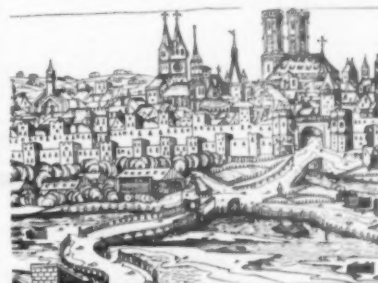
PAUL RITTER



*Amæboid Movement: Tendency to spiral movement modified into waves by desire to reach a goal*



*Spiral path of blindfolded man not influenced by desires to reach a goal*



*Spontaneous tendency to design paths in waves to speed scale of man and horse*



*Waves for speed scale of motor on M1. Even at that scale there is an impulse to, and pleasure in, every motion*

What science leads to such important integrated findings as the universal occurrence of wavy motion, illustrated above, all modifications of a general tendency to spiralling? Not the analytical, quantitative, mechanical science we would be teaching our students if we severed the "pre-clinical" from the "clinical" period



## New course in the theory and practice of building at Nottingham

### Additional information on working drawings

In the supplement last month the reader was referred to some illustrations of working drawings which were not included in the article of the above title. Difficulties regarding reproduction of actual drawings could not be overcome. As, without some further information on this part of the course, the picture given would be distorted, further verbal and diagrammatic description is given on this page.

Procedure is roughly as follows: the student has studied constructional aspects of his building as he designed it, and, at a given stage he produces drawings for bye-law and planning approval, filling in the relevant forms. These drawings are

also used as key drawings to give an overall picture.

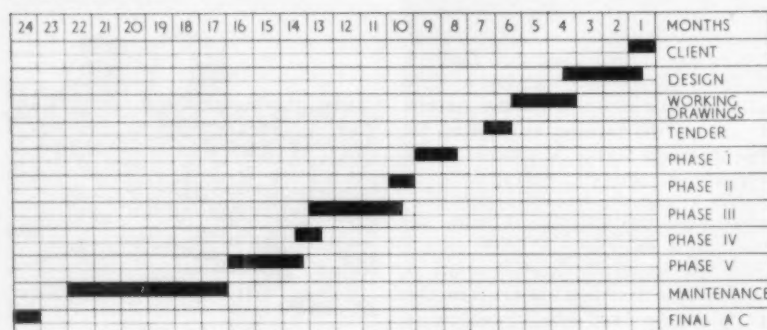
Subsequently he sets out to list all the drawings and studies he might undertake if he was to build the design. Next he makes a selection of the work he intends to carry out, drawn from the comprehensive list. Such a selection is appended. Now these 20 or 30 or 40 drawings and schedules are not to be confused with the normal ant-heap-type working drawings. They take one trade or process at a time. Details show how the various parts fit together, which can also be seen from the key drawings. Some of the sheets look very empty. All are very clear; eg, a brickwork plan

shows the brickwork dimensions with all openings, referenced to sections, if possible on the same sheet, but little else.

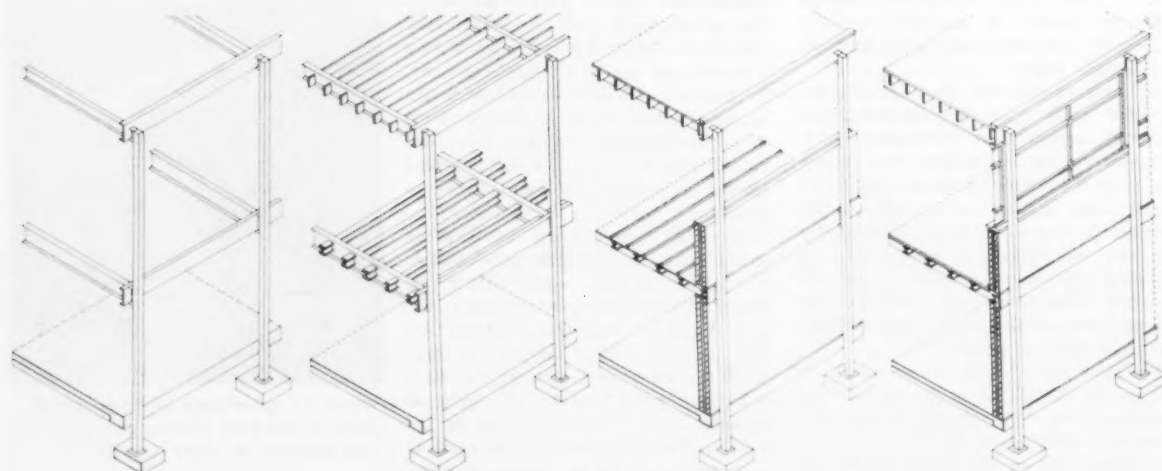
With this approach students get a better idea of who does what, and when, and how their building is made up. The phasing, timing and costing of all or part of the building is encouraged.

The student knows he does not produce "a complete set of working drawings." But his collection of studies and drawings indicates to him a logical and efficient approach to working drawings, as a means of communication. All the illustrations are taken from the work of E. Marchant, Yr III.

### Time schedule



Below, left to right, diagrams illustrating Phases I to IV. Phase V is not illustrated



#### PHASE I. Drawings Nos 2-15 and 28

- 1 Demolition
- 2 Excavation—including trenches
- 3 Drain layer
- 4 Services—to ground floor level
- 5 Hard core—to ground floors, road, etc
- 6 Concrete foundation bases
- 7 Steel erection—including carcass of stairs

#### PHASE II. Drawings Nos 13-17

- 8 Precast concrete floor beams and filler blocks
- 9 Timber roof joists
- 10 Temporary roof drainage

#### PHASE III. Drawings Nos 9, 10, 13-15, 18-22, 27

- 11 Complete roof construction
- 12 Lay screed for wall base
- 13 Fix sliding door track
- 14 Brickwork—infill and partitions dpc's
- 15 Complete and make secure RWP's
- 6 Continue all services to fitting points
- 7 Fix all plumbing fittings
- 18 Screed generally and cast in machine mountings, mber fillets, pcc sills, ceiling mangers, etc

#### PHASE IV. Drawings Nos 21-27 and 34

- 19 External door and window frames
- 20 Internal door frames and linings
- 21 Hang external doors
- 22 Ironmongery (handles, temporary)

### Drawings schedule

#### Dwg Type

#### A Diagram Building Sequence (shown below)

- 1 Schedule Dwg's
- 2 Key Site and location plan
- 3 Key GF plan
- 4 Key FF plan
- 5 Key Roof plan and section
- 6 Key Elevs 1
- 7 Key Elevs 2
- \* 8 Layout Conc bases
- 9 Layout Prelim services GF
- 10 Layout Prelim services FF
- 11 Layout Steel
- 12 Detail Steel
- \* 13 Detail General 1
- 14 Detail General 2
- 15 Detail General 3
- 16 Layout Conc joists
- 17 Layout Timber joists
- \* 18 Brwk GF plan
- 19 Brwk FF plan
- 20 Brwk Elevs w and e
- 21 Schedule Door and window GF
- 22 Schedule Door and window FF
- 23 Schedule Window elevs
- 24 Detail Windows 1
- 25 Detail Windows 2
- 26 Detail Windows 3
- 27 Detail D8 and D15
- 28 Detail Staircase
- 29 Detail Sink unit

#### PHASE V. Drawings Nos 23, 29-34 (no diagram)

- 23 Glazing
- 24 Ceiling—light fittings, switches, power points, etc
- 25 Fix machinery
- 26 Complete floor finishes
- 27 Plasterer
- 28 Hang remaining doors
- 29 Fix timber fittings; skirtings
- 30 Benches, desks, etc
- 31 Scrub clean, dry—seal timber floors
- 32 Fix all remaining fittings
- 33 Paint, varnish, etc
- 34 Make ironmongery secure
- 35 Finish road and paths etc



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8' x 4'; 8' x 3';  
7' x 3'.

**FORMICA\***

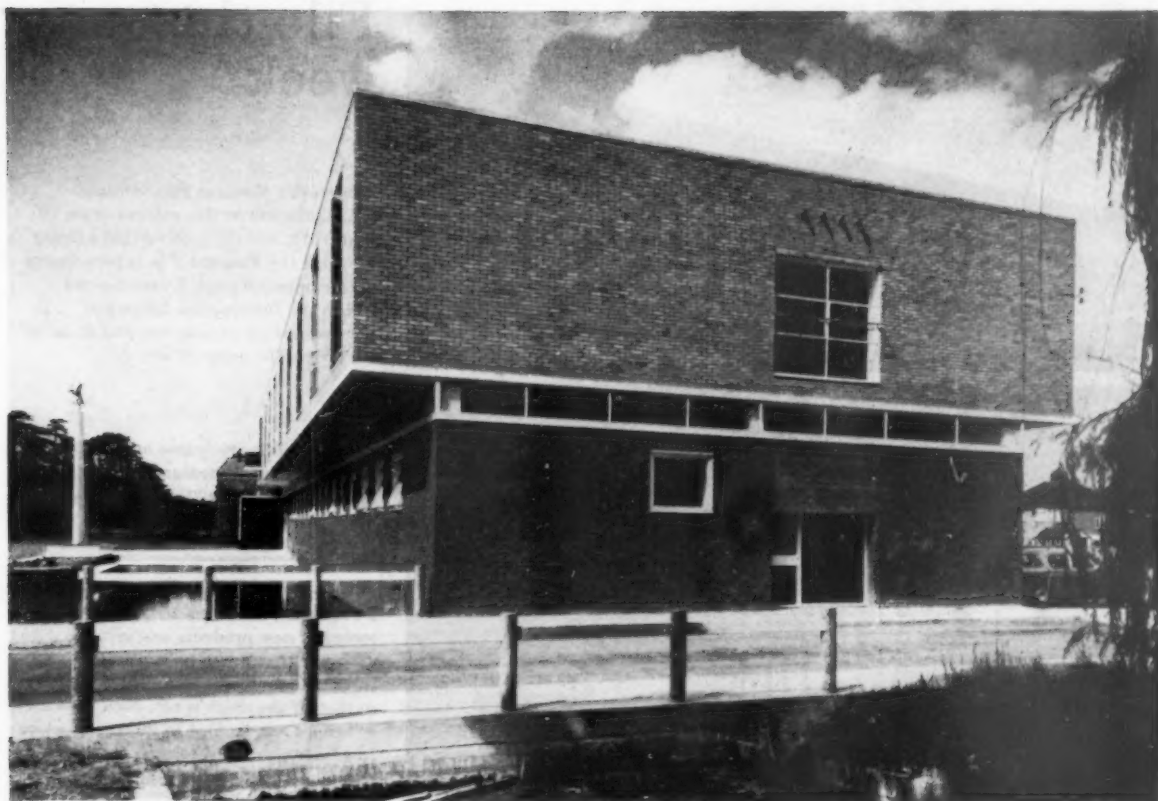
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Barbour Index File Number 193





## Enfield Civic Centre



*The first stage of the new Enfield Civic Centre has now been completed, forming part of the administrative block, and consisting of the council suite and the town clerk's department. Designed by Eric G. Broughton, the scheme was the subject of an architectural competition in 1957 (results published in AJ 12.12.57). The building has a reinforced concrete frame, faced externally with yellow stocks and blue brick, with a box-framed concrete basement. This first block is set out on the site so that it is separated from the road by the New River Loop, which runs immediately under the main frontage. Later additions, presumably shelved indefinitely because of the credit squeeze, will include an office tower block and an assembly hall*



## Railway station at Barking



Two views of the Barking railway station (H. H. Powell, architect Eastern Region) which is now in operation, including a generous passenger concourse spanning nine tracks at road level. The deck carrying the concourse is on in-situ columns carrying precast prestressed beams which were used to reduce

structural depth to a minimum, to create the additional head room required for overhead electrification. The reconstruction, made necessary by the electrification of the Southend line, also includes ticket, parcels and inquiry offices, new platform buildings and a new subway

## ANNOUNCEMENTS

Upon the retirement of J. E. Adamson, DSO, OBE, FRIBA, A. L. Gray, FRIBA, and D. M. B. White, ARIBA, dip arch, the practice of G. Gordon Stanham, Adamson, Gray & Partners will be continued by A. F. G. Stanham, FRIBA, FRICS, and C. S. Campbell, ARIBA, under the title of G. Gordon Stanham & Partners.

C. H. Elsom & Partners have made R. L. Nicholls, ARIBA, a full partner and G. E. Latter, B Arch, MCP, ARIBA, and A. F. Roberts, ARIBA, associates of the firm which will continue under the same name.

The London office of Frederick Hill, FRIBA, AMPL, FILA, has been moved to 180 Fleet Street, London EC4 (telephone Holborn 3546).

R. M. Pigott, FRIBA, M. M. Pigott, FRIBA, and R. H. Haydon, FRIBA, of R. Mountford Pigott & Partners have taken into partnership Z. E. Kolek, ARIBA, D. T.

Doxat-Pratt, ARIBA, and M. E. Dixon, ARIBA, and the practice will continue at 3 Cromwell Place, London SW7 (telephone Kensington 1242).

John Voelcker, AA Dip ARIBA, has moved to Sutton Place, Sutton Valence, near Maidstone, Kent (telephone Sutton Valence 2184).

Since his recent appointment as principal assistant architect to the Northern Ireland Hospitals Authority, P. M. Bone, dip arch, ARIBA, has moved to 77 Clifton Road, Bangor, Co Down, Northern Ireland.

Jackson & Greenen have incorporated the firm of E. A. Down & Son of Bournemouth. E. A. Down of this firm is acting as consultant on contracts for a period for which Peter A. Down, MA, ARIBA, will be generally responsible. R. Brown, dip arch, ARIBA, S. N. Goldsmith, S. R. Jones, ARIBA, J. Keelan, B Arch, ARIBA, D. M. C. Sharpe, ARIBA, have been taken on as associate partners.

## File this week

This week's Element File, covering sfb (2) *Structures: General*, starts on page 1015, but the Information Library, of which the Element File is part, starts on the opposite page. Every feature within the Information Library is preclassified for tearing out and filing in sfb order. The subjects are:

1 Technical Study (pages 999-1002) **Permanent supplementary artificial lighting in hospitals.** This should be filed under sfb (94): UDC 725.511.

2 **Products File** (pages 1003, 1004). This record of new products and services is so arranged that it can be cut into A6 sheets. Each item is classified separately so that, if the sheet is cut, each product or service can be filed in its correct place. Alternatively, the sheet can remain intact and be kept with earlier and later sheets under Aa2 in an sfb file.

3 Working Detail (pages 1005, 1006) **Walls: External non-loadbearing.** To be filed under sfb (21): UDC 69.022.324.

4 Building Study, 2nd series (pages 1007-1014) **Flats in 5-storey building.** To be filed under sfb (98): UDC 728.2.

The Element File contains:

5 **Element Design Guide** (pages 1017-1027)

6 Information Sheets: Four on **Surface structures** and one on **Single-storey frames structures**

The Element File also contains a number of advertisements concerned specifically with the file's subject.



AJ

SfB (94)

Technical Study UDC 725.511 General hospitals

## Permanent supplementary artificial lighting in hospitals

*Two years ago we published an article by Dr R. G. Hopkinson on permanent supplementary artificial lighting of interiors. This week the same author applies his findings to the problems of hospital design. The work described has been carried out as part of the research programme of the Building Research Station of the Department of Scientific and Industrial Research, and this paper is published by permission of the Director of Building Research*

### SUPPLEMENTARY LIGHTING: BASIC PRINCIPLES

#### Visual adaptation

The technique for the permanent supplementary artificial lighting of interiors (PSALI) was devised at the Building Research Station as a system for the integration of daylight and artificial light in the design of a building in such a way that the daylighting character of a room can be retained while providing sufficient working illumination to modern standards. PSALI is based on subjective considerations. When we are in a room and have a good view of sky through a large window we are in a state which physiologists call "light adaptation," that is, our eyes are partly adjusted to the high level of daylighting prevailing out of doors which we can see through the window. As a result of this the more remote parts of the room may appear dark even

though a light meter would indicate a high level of illumination. The light meter cannot adapt in the way that our eyes can. This state of light adaptation not only makes the remoter parts of the room appear dark, but it prevents the eye from functioning as efficiently as it otherwise would in the available illumination. PSALI therefore has its special applications in deep rooms, or interiors where other considerations demand low ceilings, factors which make good daylight penetration difficult to achieve. The purpose of the supplementary lighting is to provide (a) a high level of light for the necessary working illumination; (b) light to raise the apparent brightness of the darker parts of the room to a level sufficient to ensure that the whole room appears bright; and (c) adequate brightness in the room to counter, as far as possible, the effects of the glare discomfort caused by the bright sky seen through the window.

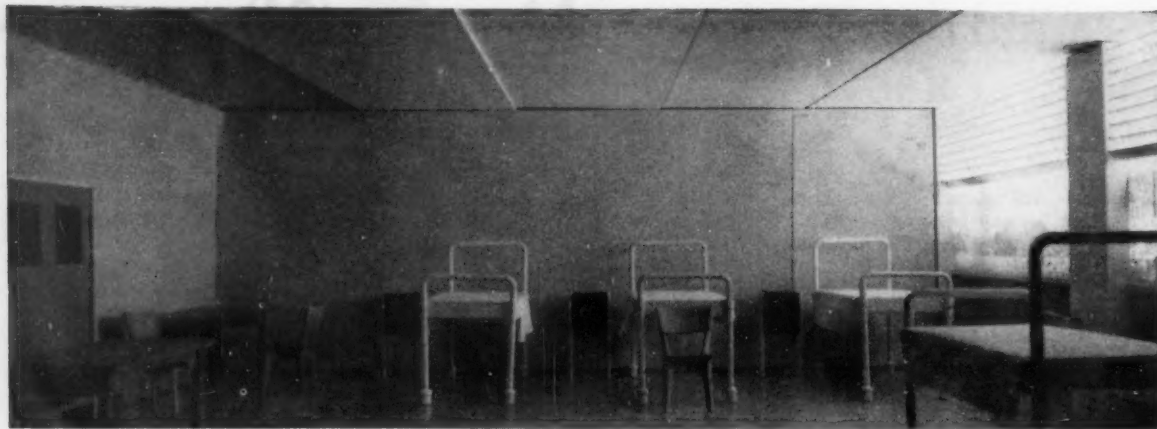
If the principle of PSALI is accepted in the initial design of a room, windows can be provided with anti-glare devices without serious concern about their effect on daylight penetration, because the light from the sky can be combined with the artificial supplement so that together good working illumination results.

#### Necessary level of supplementary light

In a previous article\* details were given of methods for designing supplementary light, and these are equally applicable in hospital ward design. The levels of supplementary light and of natural light are interlinked, as was shown in the previous article. Thus for a hospital ward lit from both sides, 40ft deep, with a minimum daylight factor of 1 per cent in the middle of the ward, the level of supplementary lighting which would have to be provided

\* The use of permanent supplementary artificial lighting, AJ 8.10.59





*Fig 1 A model of a six-bed ward, with anti-glare louvers over the window to shield the patients in the outer beds. Insufficient daylight penetrates to the back of the room*

in the interior of the room would be of the order of 50 lumens per sq ft.

The level of daylight itself will have to be determined from many considerations. These will include the use of the windows for ventilation, and other non-visual factors which will not be discussed here. From the point of view of visual amenity, however, it has to be remembered that a room ceases to appear to be adequately lit by daylight if the fenestration is less than about one-tenth of the floor area, however skilfully the glass is disposed about the room. With less than this amount of glass the windows appear to be merely "view slits." Contact with the visual world outside is generally felt to be necessary for hospital patients, and so well-designed windows, placed properly in relation to the position of the beds, are an essential requirement of good ward design. The degree of fenestration best suited to the use of PSALI in a hospital ward is of the order of one-sixth to one-eighth of the floor area. A wide choice of window design and positioning is possible within these limits. The levels of PSALI will then be found to be within the range of 20-50 lumens/sq ft.

#### DESIGN OF WINDOWS

Windows used in conjunction with PSALI need care in detailing to avoid excessive sky glare. The placing of windows can be planned on the understanding that the penetration of daylight is no longer the chief consideration to be observed. Consequently in a hospital ward it may be possible to design the windows so that there is a view of the landscape below bed level, and not only of the sky above. The level of the window sill may well be dropped even to floor level. The upper parts of windows can be provided with screens, baffles, or louvres, or with adjustable blinds or curtains to limit the view of sky on bright days, in the knowledge that any loss of light caused by these devices can be supplemented by the artificial light. Windows with splayed reveals are particularly suitable in conjunction with PSALI. The interior light will brighten the walls and add further to the ability of the reveals to buffer the effects of sky glare.

#### SUPPLEMENTARY LIGHTING IN HOSPITALS

Supplementary lighting should be designed with the building in mind and not added as an afterthought. The biggest problems in hospital design are to lay out the various rooms and services to give at the same time efficient circulation and good daylight. Many of these problems can be solved if PSALI is embodied in the initial design.

The visual requirements of the various parts of the hospital include the following:

1. *Wards.* Good but comfortable light by day, fresh but not

unduly stimulating character to the room, a view of the surroundings from the bed positions, absence of severe shadows, sufficient modelling, low level of comfortable lighting at night.

2. *Nurses' stations.* Good local light, easy view of all parts of the ward under supervision.

3. *Service rooms and ancillaries.* High and constant level of working illumination.

4. *Day spaces.* Emphasis on visual comfort.

5. *Laboratories.* High and reliable levels of working illumination, with only a moderate level of visual discomfort.

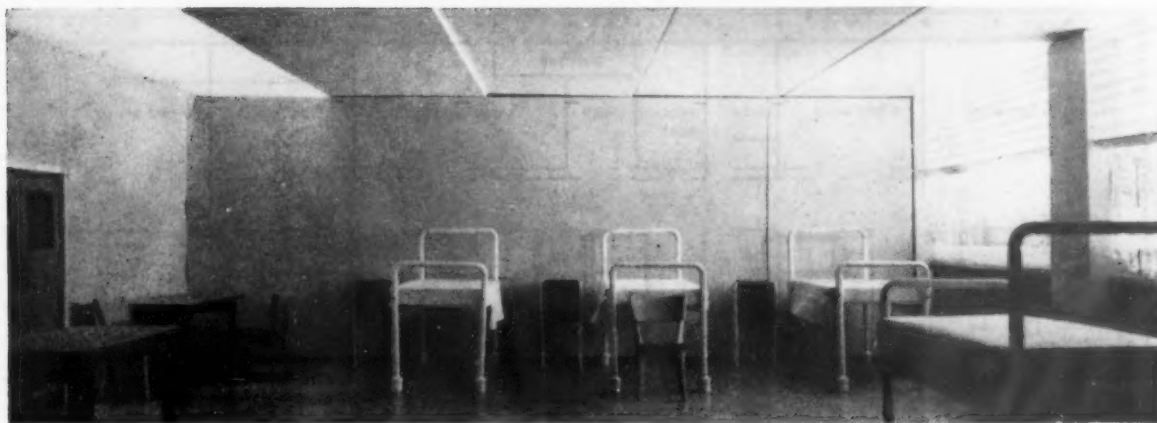
6. *Operating theatres.* Maximum possible working illumination, with emphasis on visual efficiency and comfort.

From the above considerations it will be seen that PSALI is of particular value in wards and day spaces, to permit a reduction in visual discomfort from sky glare, while retaining a good view of the surroundings outside. PSALI also has its uses in laboratories and service rooms to permit a high and reliable level of working light to be maintained throughout the day. Operating theatres, if they require daylight at all, need it only for the relief it brings after the work is done; and nurses' stations are best considered as part of the ward with special local light provided over the desks.

#### PSALI IN WARDS AND DAY SPACES

The application of PSALI to hospital ward lighting is closely tied up with ward design. Both the long narrow ward known as the Nightingale ward and the more modern ward of greater depth known as the Rigs layout, lend themselves easily to PSALI. Small isolated wards of four beds are less likely to need supplementary light unless the ceiling height is unusually low. Consequently there may be less use of PSALI in the so-called race-track design. This design forms a deep compact unit having the small wards around the periphery of the building, and with a central core of ancillary rooms. Small wards would almost certainly be lit entirely by daylight during the day, and by normal artificial lighting when daylight fades, but larger wards, of six or eight beds, might well be provided with PSALI. The service and ancillary rooms would be without daylight and would depend entirely on a high quality of artificial light, chosen to give good colour rendering. The level of lighting in these





service rooms would have to be high, to prevent unfavourable adaptation conditions arising when staff moved from the daylight wards into the artificially lit service rooms. This would mean levels of the order of 50 lumens/sq ft. The lighting to achieve favourable adaptation conditions would necessarily be planned with the hospital design. In the case of Rigs or Nightingale wards, it can be deduced, as indicated previously, that good overall lighting will be achieved with glazing of the order of one-sixth to one-eighth of the floor area, and with supplementary lighting to a level of the order of 30 lumens/sq ft. The design and the placing of the windows can then be guided by the need to avoid sky glare and by the patient's desire for a view. The supplementary light needs careful positioning in relation to the bed positions. It can be built into the ceiling, or erected as a ceiling mounted laylight. If this is done, the lamps must be recessed into some form of screening device, a louvre, an "egg crate," or a honeycomb system such that, not only are the lamps themselves invisible from the beds, but the brightness of the laylight is not more than three times the brightness of the ceiling adjacent. Methods exist for computing the characteristics of such a lighting system. Where possible the system should be mounted so that it is not too obtrusive in the sight of patients lying in bed. It would obviously be foolish to go to considerable trouble to mitigate glare from the sky, only to introduce further glare from the artificial lighting system. In day spaces the exact position of the supplementary lighting is less critical, and it can be used to create the character of the space, together with the natural lighting.

The new edition of the Illuminating Engineering Society's Code gives precise recommendations for limits of tolerable glare in hospital buildings. The glare index for wards should not exceed 13, but for day spaces it can be as much as 16 if by this freedom some interest of stimulation can be introduced. Additional glare without such interest is of course to be avoided. Here again techniques exist for computing the glare index.

The type of lamps to be used in the supplementary lighting system must be chosen with care, and the problem is referred to later.

#### LABORATORIES AND SERVICE ROOMS

In some American practice, service rooms are lit entirely by artificial light, and this "race track" principle assists planning considerably. If people are not expected to work in service rooms continuously, there seems to be no objection to this practice provided that the level of illumination in the service rooms is comparable with that in the wards outside. This high level of illumination is necessary, primarily to avoid any abrupt change in adaptation when

*Fig 2—The ward, provided with supplementary artificial lighting from a recessed laylight containing fluorescent lamps giving a level of 30 lumens/sq ft under the laylight. The overall lighting of the whole ward is improved. Levels are right for daytime, and there is no glare*

coming from an artificially lit service room into the adjacent ward or laboratory lit by daylight. In practice this means that the level of artificial light must be of the order of 30–60 lumens/sq ft during the day, dropping to 20–30 lumens/sq ft at night.

Laboratories, however, should be provided with daylight if possible. The PSALI should be designed to supply the working illumination over those parts of the room which are not fully lit by the available daylight, a supplementary level of 50 lumens/sq ft being designed *ab initio* into the building. If long narrow laboratories with the window on a short wall are considered desirable (from the point of view of ease of servicing) the PSALI should be carefully related to the nature of the work in the room. It may not always be possible to locate all visually difficult jobs near a window. Among the precautions to be taken must be choice of local lighting and colour and reflectance of the wall surfaces against which objects are seen (for example for making titrations).

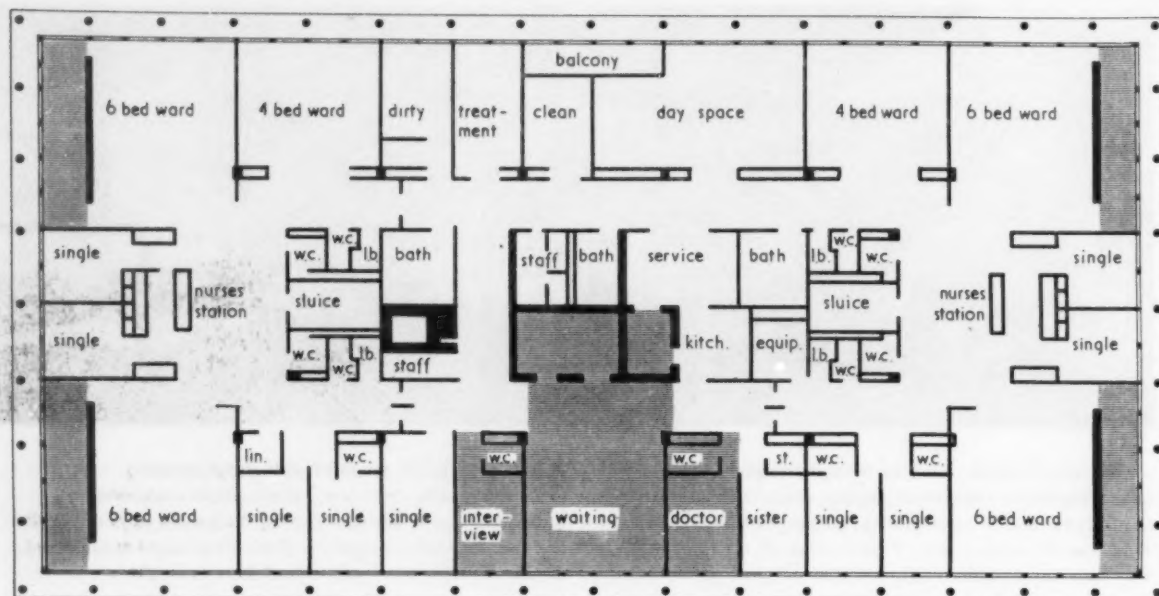
The supplementary lighting should be thought of not only in terms of the daylighting, but also in terms of the nighttime lighting, because much work may be done in the laboratories after dark. The installation may well consist of a double or triple system of luminaires, of which one or two sections are in use by day, and all by night. Careful choice of lamps here is also necessary bearing in mind the nature of the work. Hard and fast rules cannot be given, the choice of lamps should be made in consultation with a competent lighting engineer.

The permissible limiting glare index in hospital laboratories is 19, and this should not be exceeded. In practice this means that large bright diffusing fittings cannot be used, but some control and screening from direct view are essential.

#### Administration offices

PSALI in hospital offices can follow the same design principles as in other general offices. Its special advantage in hospital design is that it can assist the planning and the placing of the offices in the building relative to other accommodation, since full daylight over the whole office space is not necessary if there is supplementary artificial light.





## CHOICE OF LAMP FOR SUPPLEMENTARY LIGHTING

*Fluorescent lighting and its critics*

One possible target for criticism in the use of PSALI in hospitals may be the fact that it must always employ fluorescent lighting. Incandescent filament lighting is in general unsuitable for PSALI, partly because the colour does not blend with daylight, and partly because the heating load which results from the high levels of illumination which are necessary may be a serious problem on warm days.

It must be remembered that daylight itself is not consistent in colour, sunlight being much warmer and redder than blue or overcast sky-light. The best light to use for PSALI is hot or cold cathode fluorescent light, the colour to be chosen with special reference to the medical requirements. The so-called daylight colour lamp is still well removed from true daylight both in its inherent colour and in its colour rendering of objects, and so it is not ideal. On the other hand it appears to occasion fewer adverse comments when used to supplement daylight than do some of the warmer colours. Where good colour rendering is vital, special lamps made for colour matching purposes must be used, and if the highest accuracy in colour rendering is needed, a mixture of fluorescent lamps with a few filament lamps carefully blended and positioned to conceal the sources themselves should be used. Such a blend can be made almost indistinguishable from daylight. It is very important, however, that the services of a qualified lighting engineer should be engaged where any problem of colour rendering is involved. Simple rules cannot be laid down.

In the early days of fluorescent lighting, complaints of bad colour, poor vision, and flicker were to some limited extent justified. Much improvement has been effected in recent years, but prejudices still exist and are often hard to overcome.

Fluorescent lighting has now been in use for 20 years, and so far no evidence of any weight has been produced to show that it is any more harmful to vision or to well-being than other forms of light. The one exception is on the score of flicker, and this is not a serious problem. Fluorescent lamps, from their nature as discharge lamps, must necessarily flicker more than do filament lamps, quite apart from the intense flicker sometimes visible to everyone due to bad installation or faulty gear, a situation which should never arise in a well-engineered lighting system. Some

Fig 3—The "race-track" unit, with small wards around the periphery and the service rooms in the interior. The service rooms rely entirely on artificial light, which must be of a level comparable with the daylight in the wards (about 50 lumens/sq ft)

people, perhaps 1 per cent of the population, are inherently more sensitive to flicker and their condition may possibly be aggravated by sickness, but for this we have no evidence. Complaints of flicker should be taken seriously, and not brushed aside as the querulousness of the sick. A good lighting installation, with the lamps "dephased" by suitable ballast circuit, or wired on a 3-phase mains supply, will avoid most of these difficulties.

*PSALI after dark*

The levels of artificial light necessary to balance bright daylight may be higher than are necessary, or indeed desirable, after dark. This is much more important to consider in hospital wards than, for example, in offices. In wards the lighting provided during the evening should not be too bright, and it is most important that it should be completely free from glare. For this reason it will be almost essential to have an entirely independent evening-time installation for wards. This should preferably be of filament lighting, free from glare along the lines suggested by Hopkinson\* and described by Musgrove and Wellwood Ferguson.† The expense of the dual installation can be reduced by using the same supply wiring for both, with suitable interlocking switching. The change from day to evening lighting should be made when daylight fades, before the supplementary lighting dominates the room. The appropriate point can be judged subjectively, or it can, if necessary, be done automatically by a suitable photo-electric control system. Such a system must incorporate a certain lag in its operation. It should not in any circumstances switch the lighting immediately daylight falls below a given level.

\* HOPKINSON, R. G. *Problemes d'ambiance dans les salles d'hopitaux*. Journées de l'Eclairage 1957, pp 208-210. (Report of June meeting.)

† MUSGROVE, J., and WELLWOOD FERGUSON, W. J. *Hospital Lighting*. CIE Proceedings 1959 Paper pp 59-21.



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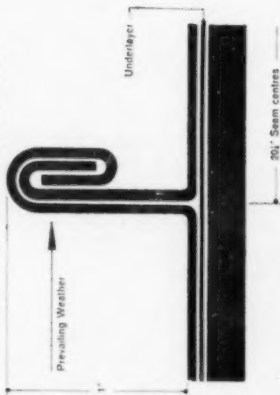
### Copper faced built-up roofing

The Ruberoid Company have for some time been producing a copper faced roofing sheet with a backing of filled bitumen. The material as originally produced had to be made in sheet form, but the new version can be rolled, which simplifies transport and should also make it easier to lay. It is made with a facing of 42 gauge copper sheet and is supplied in rolls 18 yards long and about 2 ft wide. Joints can be single welled seams at 21-in centres or double welled standing seams at 20-in. Alternatively the material can be fixed with welled seams over battens rolls, the centres here depending on the size of the batten.

The copper surface has closely spaced hemispherical indentations giving a wave form in every direction, thus reducing the effect of thermal movements in the substructure. The complete roof is always fixed with an underlayer to which the copper roof is bonded on site. Mechanical seams are not relied upon for fixing, as the whole roof is bonded to the substructure and all joints and seams are fully sealed. The copper does not

SIB (47) Md

UDC 69 024 156



Copper faced built-up roofing

work harden as it is flexible enough to be worked by hand. Minimum fall for roofs is 2 in in 10 ft or 1 deg. Fixing is by Ruberoid's Contract Division. Clear information is provided in a new leaflet, A6 size and SIB classified.

The Ruberoid Co Ltd, Commonwealth House, New Oxford Street, London WC1

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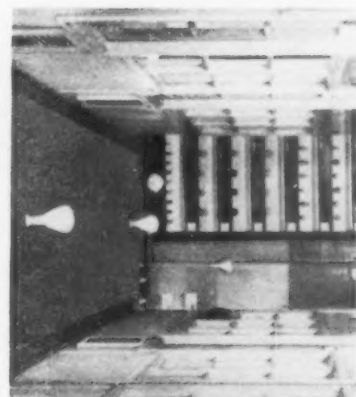
### Simplified lighting

The latest development from Ascot Lamps is a bulb which also forms its own fitting. The shape, as can be seen from the illustration, more or less follows current ideas, and looks quite neat in a lampholder fitted with a skirt. It is claimed that the surface brightness of the lamp does not vary between different parts of the surface, as the inner face of the glass is coated with titanium dioxide made by a patented process. The lamps are made in 150 and 200 watt sizes, and have a guaranteed life of 2,000 hours. Since the lamps are a complete fitting in themselves, the cost of shades or globes is avoided, and there can be no internal dust to be removed. Prices are 12s 6d and 17s 1d for the two sizes.

Ascot Lamps are members of the Radiation Group, and after 30 years of seeing the blue triangular badge on gas water heaters it is faintly surprising to see it now associated with lamps as well, though I suppose there is no real reason why it should not be.

SIB (63)

UDC 628 94



Ascot lamps used in a corridor

Ascot Lamps & Lighting Ltd, Arcola Street, London E8

AJ Products File November 22 1961

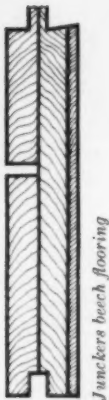
### Hardwood floorings

Junkers beech flooring is supplied in boards 12 ft 4 in long,  $\frac{3}{4}$  in thick, and with a face width of  $\frac{4}{4}$  in, each board being planed, tongued and grooved to very accurate limits, and with the face sanded at the factory. Each board consists of a number of strips  $2\frac{1}{2}$  in wide by about 24 in long, kiln dried and assembled with double dovetail joints into a single board, which thus has the appearance of a  $2\frac{1}{2}$ -in face when laid on the floor. The floor is quick to lay, since each board has an area of half a square yard, and finishing costs are reduced by the pre-sanded face.

Laminated floorings are also produced, and provide a decorative floor at considerably less cost than traditional parquet. Each board is made with a longitudinal pine base, a transverse pine core and a hardwood face of beech, ash or oak, the three layers being cemented together under pressure with a waterproof glue, the face being sanded like the other boards. This type of flooring is made in both long strip and basket weave

SIB (43) H13

UDC 69 025 351 1



Junkers beech flooring

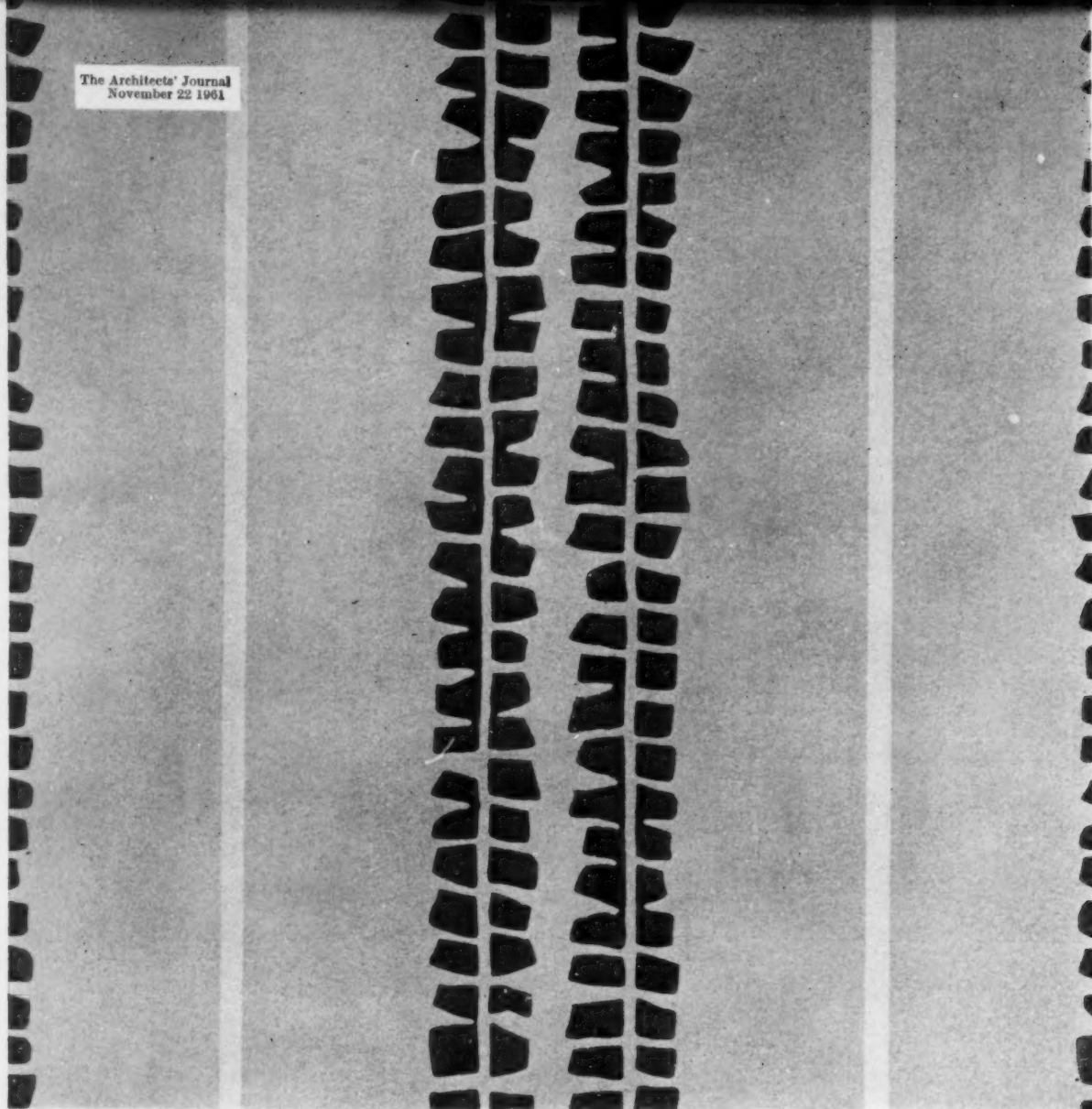
patterns and in two thicknesses,  $\frac{1}{2}$  in for laying over existing floors, and  $\frac{3}{4}$  in to lay direct on joists or battens which may be spaced up to 24-in centres, according to the floor loading.

Junkers (London) Ltd, 17 Hanover Square, London W1

### Products File by Brian Grant

The Industry has been replaced by Products File. Each item occupies a quarter-page (ie A6 size) and is given an SIB number so that readers may cut the page and file each under its number if they wish. Alternatively, they may tear out the whole page and file all Products File pages together. Products File pages never back on to editorial matter. Readers wanting more information from manufacturers may turn to the back page where they will find Products File items included in the lists of advertisers. The reader, therefore, has merely to tick the manufacturer's name, add his own name and address, detach the page and post it to the Journal, using the reply paid folder.





"Cordus" designed by Karin Warming. M 1020 shown to scale

A new collection of machine printed wallpapers has just been compiled by the London Office of The Wall Paper Manufacturers Limited 19/21 Mortimer Street, W.1. and is now available through wallpaper suppliers. Many prominent designers are associated with this collection among them Lucienne Day, Jacqueline Groag, Terence Conran, Joyce Storey and William Gear.

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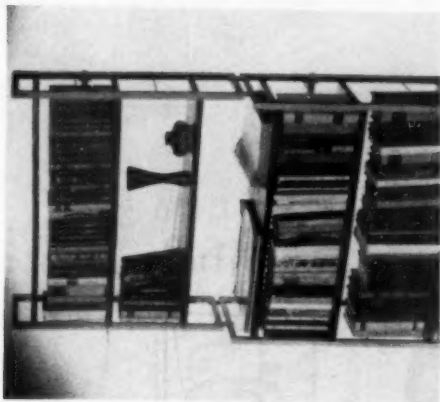


## AJ Products File November 22 1961

### Furniture for storage

A Swedish-designed system of bookshelves, cabinets and other fittings is now on sale in this country. The system is based on a series of metal frames which can be fixed one above the other and which are joined by the shelves or other units. The frames are made in four different heights, and some are in two depths, so that both 9 and 12 in shelves can be used. The frames can be joined either vertically or laterally. Standard finish for the frames is matt black, though grey is possible to special order, and the timber can be mahogany, teak or light oak. The distributors offer an advisory service for layouts, and will also do the site work if necessary. Prices are fairly high but the workmanship seems excellent.

Exqvistia Ltd, 6 Russell Gardens, Holland Rd, London W14



*Exqvistia bookshelves*

SIB (72)

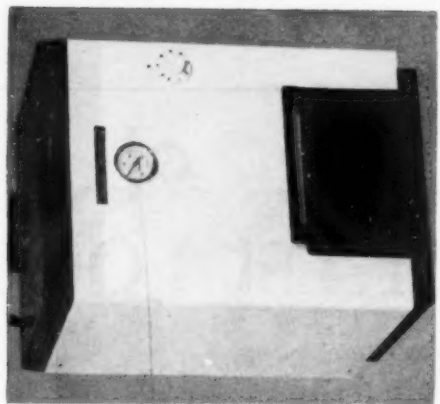
UDC 645.4

## AJ Products File November 22 1961

### Small solid fuel boiler

Tayco have just added the Thermatic type 22 to their existing range of boilers, all of which have had their casings designed by Neville Conder. The boiler burns any normal solid fuel, including anthracite or coke, and has a maximum output of 22,000 Btu per hour, enough for a 25- to 35-gallon hot water cylinder plus about 20 square feet of radiation. Water temperature is controlled by an adjustable thermostat, and the price of £255 10s includes a dial thermometer. The grate has a hand-operated shaker and dumper, and there is a deep pan which holds a considerable quantity of ash.

Tayco Boilers Ltd, 170 Victoria Street, London SW1



*Thermatic 22 boiler*

SIB (56)

UDC 697.326

## AJ Products File November 22 1961

### Ventilating fans

Vent-Axia have recently increased their range of models, which are now made in four diameters, 6, 7½, 9 and 12 in, and in different versions for mounting direct in windows, cased for setting in walls, or with a mushroom type cowl for roof mounting. Extract values for the four models are 10,000, 15,000, 25,000 and 55,000 cubic feet per hour, and all models can be provided with variable speed controls, reversing switches to give input instead of extract, and either automatic or cord controlled shutters to prevent back draught when the fan is switched off: roof models have an iris type diaphragm. Fans for use in dark-rooms or for other special purposes can be supplied if necessary.

Vent-Axia Ltd, 60 Rochester Row, London SW1

SIB (57)

UDC 697.953

## AJ Products File November 22 1961

### Commercial lighting

A new commercial lighting catalogue from AEI illustrates a larger range of opal glass type fittings for use with Mazda GLS lamps. Reference to the different types of fitting is made easier as the list has been divided into separate sections dealing with pendants, ceiling and wall fittings, and glassware. There is a wider choice of ceiling fittings, and also a standardised rod and chain suspension for a number of the pendant fittings.

AEI Lamp & Lighting Co Ltd, Melton Road, Leicester

SIB (63)

UDC 628.95



# From November 1st 1961

THE BRITISH PLASTER BOARD (MANUFACTURING) LIMITED

THE GOTHAM COMPANY LIMITED

THE CARLISLE PLASTER & CEMENT COMPANY

THOMAS McGHIE & SONS LIMITED

THE LONG MEG PLASTER & MINERAL COMPANY LIMITED

MARBLAEGIS LIMITED

## will be known as

## British Plaster and Boards Limited

The combined manufacturing, marketing and technical service facilities of the constituent companies will be deployed more effectively, on a nationwide basis to meet the growing demand for their three main groups of gypsum products — already famous throughout the building industry.

**'Thistle'** plasters and **'Thistle'** plasterboards for traditional plastering.

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**'Carlite'** plasters for the most modern methods of lightweight plastering.

This is  
our new  
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### British Plaster and Boards Limited

Ferguson House, Marylebone Road, London, N.W.1. Hunter 4021-8



**AJ**

**SfB (21)**

Working Detail No 7

UDC 69-022-324

Walls: External, non-loadbearing: General

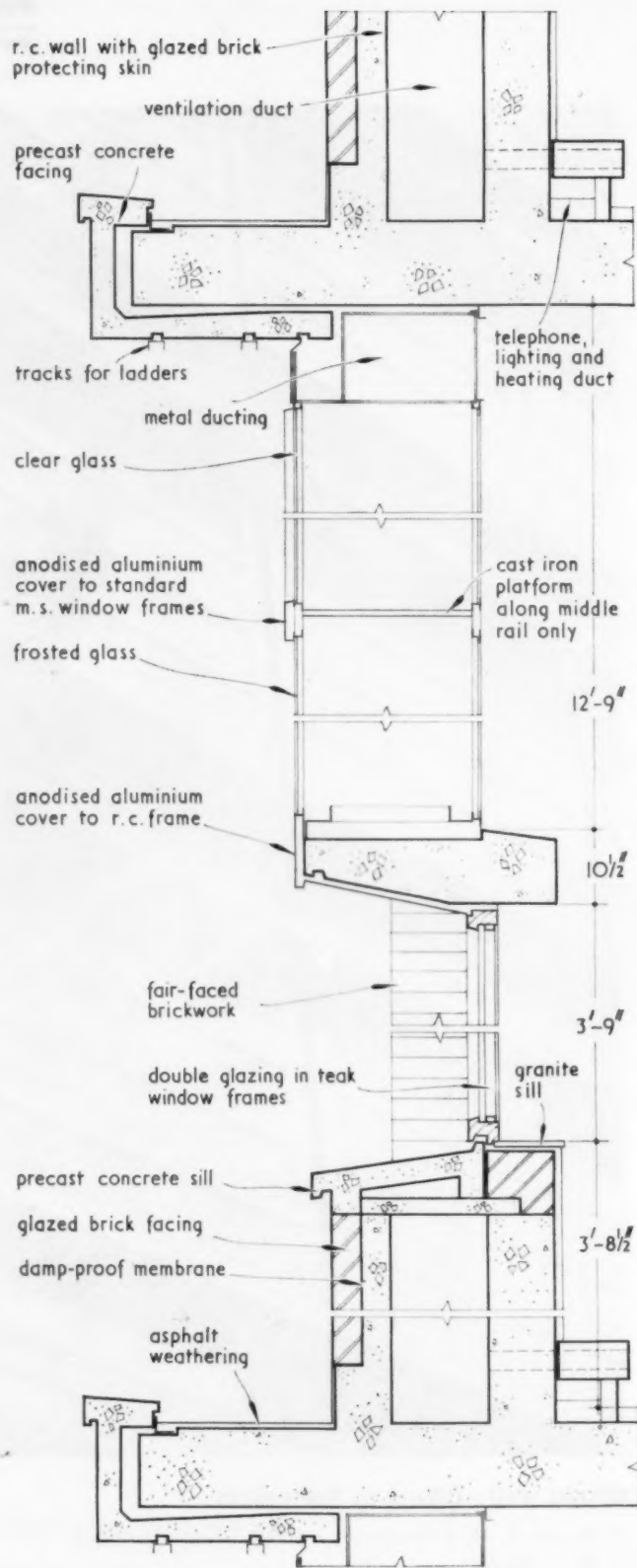
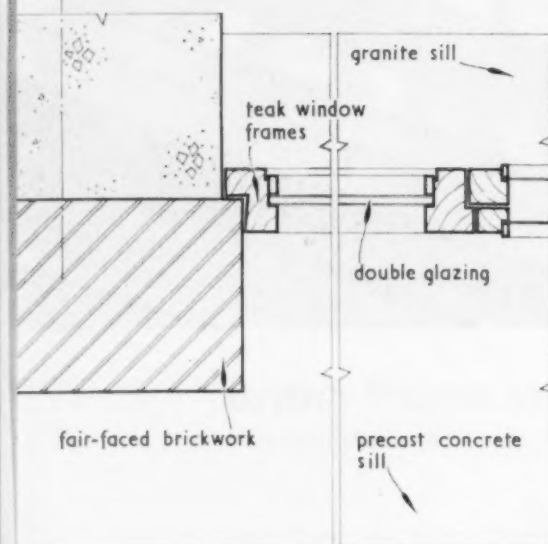
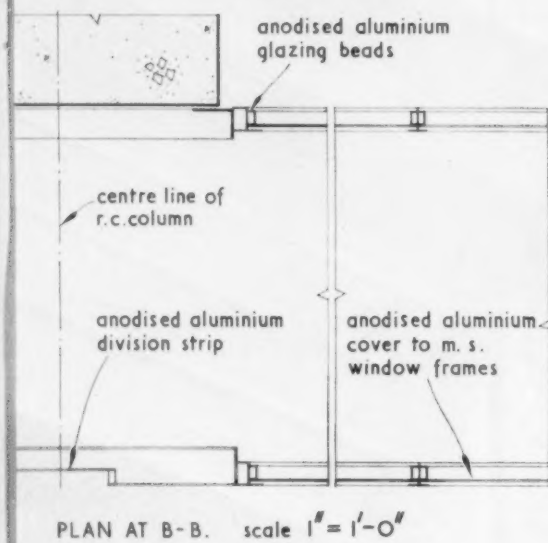
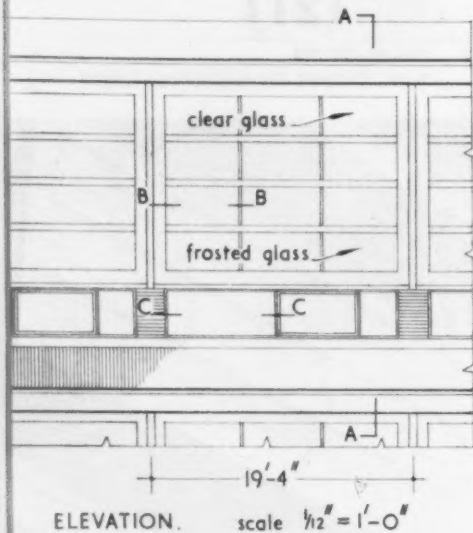


### Glazed wall: Offices in Rotterdam

*E. H. and H. M. Kraayvanger, architects (material supplied by M. G. Brady)*

*This is the facade to a postal sorting office in which sorting rooms, each over 21ft high, are sited one on top of the other. Among points of interest are the methods of cleaning (ladders running on a suspended track outside and a high level platform between the two leaves of glass in the clerestory), and also the consistent use of cladding—precast concrete, anodised aluminium and bricks—over all in-situ concrete members on the facade.*

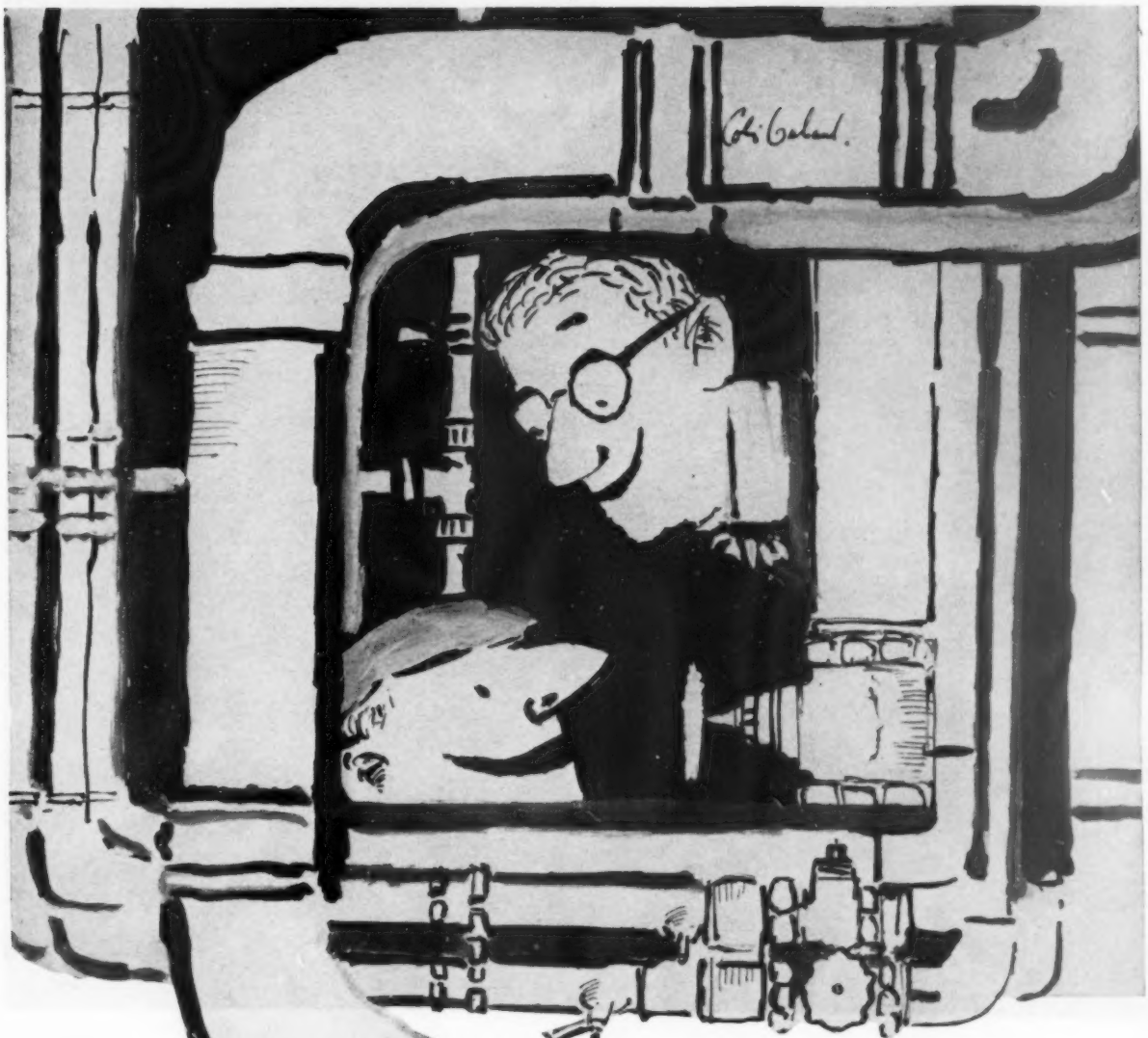




SECTION A-A. scale  $\frac{1}{2}" = 1'-0"$

note: figured dimensions in feet and inches are approximate





*It's gotta  
be really old  
said the plumber  
The brandy? I said  
The brass Foundry  
he said*

“Stands to reason, said the plumber, when a foundry's been going for seventy or eighty years, they got some valuable experience. Yes, I said. You know the stuff they produce is going to be absolutely top-quality, he said. You do, I said. Of course, just because they're old-established, it doesn't mean they close their eyes to new ideas, he said. Course not, I said. Well, name me a

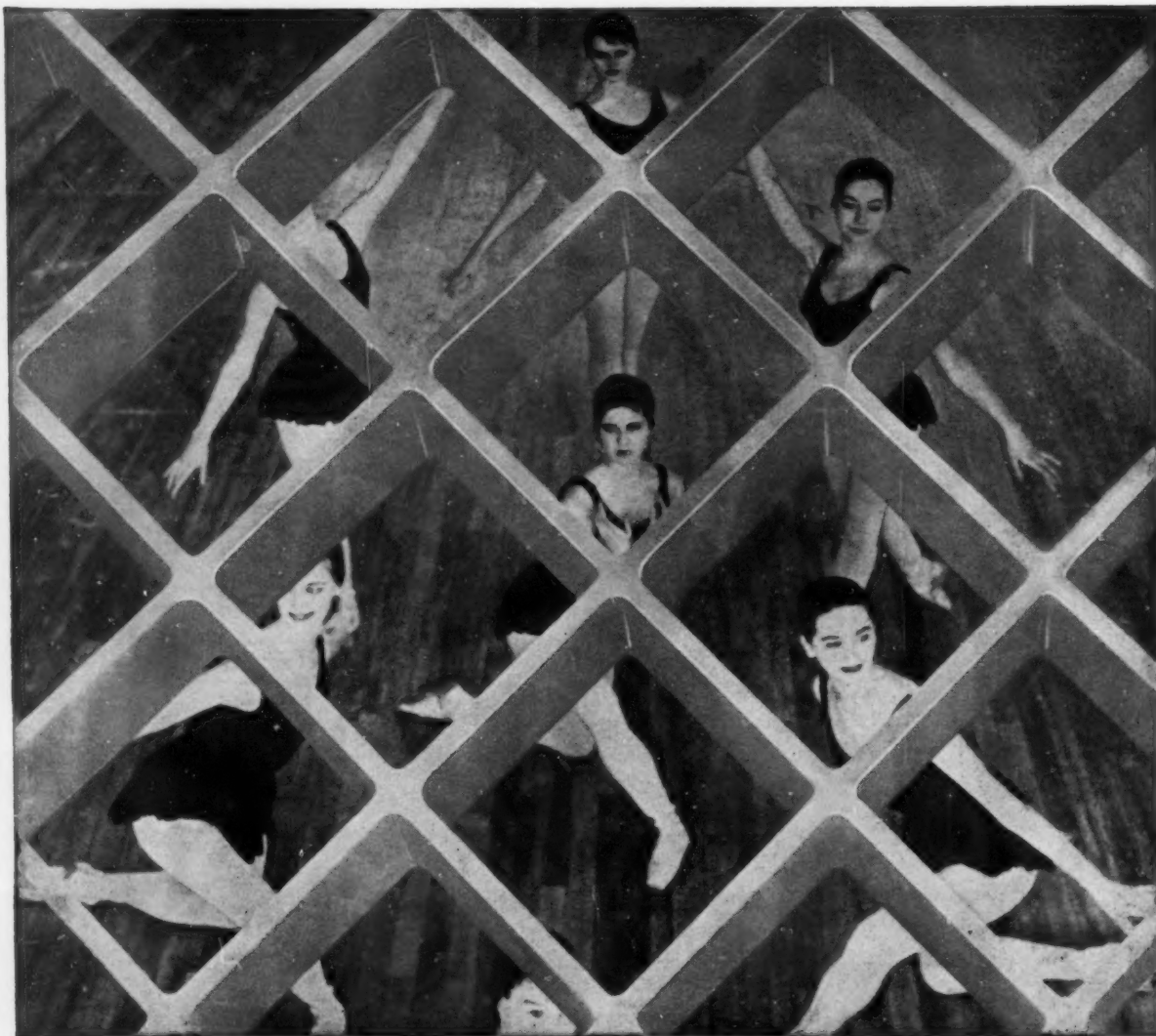
foundry that's been going more than eighty years, he said. Aston Brass, I said. Oh, yes, he said, those words are music to me—like a sort of plumber's mating call. To put it simply Aston pillar taps, drum taps, wastes, mixers and ball valves are the finest brass fittings of all. Ask us to call, or to send you details. There's something solid about Aston Brass.



part of the Valor organisation

Aston Brass Co., Bromford, Erdington, Birmingham 24 Erdington 6151





## Light fantastic

Light on her feet, light above her head. There was a time when ballet was danced by candlelight – but a long time ago. Long before Shell gave us 'Carinex' light-stabilised polystyrene.

The grille through which you see our ballerinas, is made from 'Carinex'.

It is durable, attractive and available in many grades and in all colours.

That's why it is so suitable for lighting fittings.



Shell Chemicals



Ask Shell Chemical Company Limited  
Plastics & Rubbers Division, 170 Piccadilly, London, W.1

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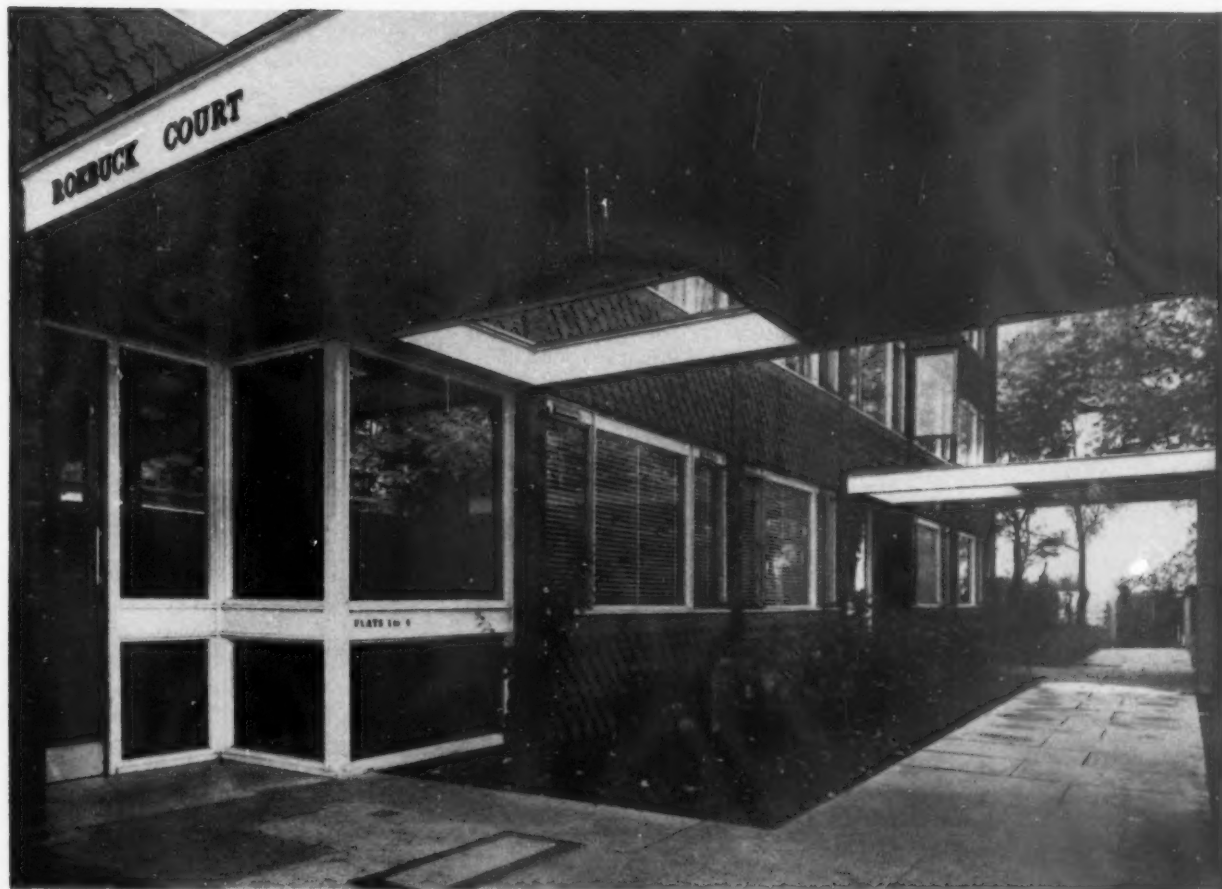
P53



AJ

SfB (98)

Building Study, 2nd series UDC 728.2 Flats: General



## Flats in Stevenage

*Link canopies between entrance halls and bin stores*

for EASTERN COUNTIES  
REGIONAL HOUSING  
SOCIETY LIMITED

designed by JOHN MORTON  
OF MORTON LUPTON

quantity surveyors HENRY COOPER & SONS,  
who prepared the analysis

*Low-cost minimal building is a challenge to the architect, and his greatest opportunity. Out of it can grow ingenuity in planning and construction, and purity of design. Roebuck Court is an example of this process in the field of low-cost multi-storey housing, intended primarily for single people or newly married couples, replacing the conventional "digs"*



## APPRAISAL

The block is sited on rising ground to the east of the A1 traffic route and is separated from it by a strip of undeveloped land which acts as a "buffer" between the noise and potential danger of the A1 (soon to be diverted) and Stevenage residential areas. On turning off the A1 and approaching the flats from Turpin's Rise (one of the tortuous roads which link the Stevenage residential areas) one is immediately faced with fourteen garages which all away from the road and largely obscure Roebuck Court. These garages, although an essential element in a housing scheme, are noisy and unsightly, giving a bad first impression of the flats themselves. Had cost not been a governing factor in the design, it would have been advantageous to have sunk these garages into the hillside, perhaps acting as a podium out of which the flats could have grown.

Once having traversed a considerable area of gravel drive-in and turned a screen wall, however, one enters an enclosed garden which is well designed to act as a pleasant lead-in to the flats themselves.

The architect was required by the development corporation to provide fourteen parking spaces in addition to the garages on what is a very limited site, which could not be increased because of future development in the area. This has resulted in this slightly barren initial approach to the flats. The future development will include four-storey blocks and an eleven-storey tower, so that the present situation by which the block dominates the surrounding two-storey housing will soon be changed. The present slightly unsatisfactory situation by which the site is unrelated to its surrounding landscape, particularly the use of temporary fencing, will in due course also be put right.

The whole aim of the project is to provide housing which can replace the normal lodgings or furnished rooms that single people or newly married couples tend to inhabit in well-established centres of population. Not only was such a project justified because of the scarcity of such accommodation in the New Town, but there has been the obvious aim of achieving a considerably improved standard, particularly in terms of privacy and independence. The objective has been to provide flats which are suitable for two people, but reduced to the absolute minimum so that the rents can be roughly in line with the type of accommodation the project is intended to replace. The architect points out that this aim is not, of course, compatible with providing family units. In fact couples are moved to larger flats or houses elsewhere as soon as possible after the first baby has arrived.

The block consists of 28 small flats cleverly arranged to give combinations of one, two or three room flats. Bunched about two staircases, the flats are so arranged as to utilise the slope in the land, giving three floors to the north and four to the south. Entrance doors to flats are at each staircase landing.

Externally this basic plan is simply expressed and benefits from lack of any pretentiousness. Load-bearing brick cross-walls are brought forward to the face of the building, windows and sub-sill panels of decorated tiles giving a strong horizontal emphasis to the design.

Materials used externally are largely traditional to house building in this country and, being well tried, are likely to prove satisfactory in life, maintenance cost, and weathering. One major criticism is the low standard of preparation and finish to all woodwork. Whether painted or (as with opening casements) varnished, it has resulted in knotholes "bleeding" through the surface, flaking paintwork, and "bald" patches where the

varnish is subject to severe weathering.

Internally, the bunching of flats around two central staircases with bathrooms and kitchens along the spine wall has created problems, such as the natural ventilation to the bathroom (complying with suggestions made by BRS). A minimum floor area, and a large electric storage heater suspended over the bath, makes the bathroom oppressive. Kitchens planned as part of the living area (the only concession to an "open" plan) are unpopular with tenants, particularly as there is no extract for cooking smells. The architects have also encountered difficulties with fire escape regulations (see Planning Aims). All these problems arise directly from an attempt to design for a minimum budget. But within the context of low cost housing, the idea of a series of boxes round the perimeter of the building with a compact service and circulation core at the centre is a successful answer. The plan is flexible and economical, resulting in a "clean" exterior and simple massing. A maximum of light, air, and outlook is given to those elements in plan which most need these qualities. A neutral decorative scheme gives a satisfactory background for a variety of furnishings. Generally the flats serve their purpose and are well received by the tenants.

The building at Roebuck Court was financed by the Eastern Counties Regional Housing Society, who are particularly concerned with housing the employees of industrial firms.

## CLIENT'S REQUIREMENTS

The client, Eastern Counties Regional Housing Society Ltd, wanted a block of small flats for the use of young single men or women or newly married couples, employees of the English Electric Company in Stevenage. The flats were to be let at an economic rent and so the design, whilst providing reasonable standards of space, equipment, etc, had to keep the overall cost to the minimum. It was required that the flats could be connected by intercommunicating doors so that flats of one room, two rooms, or three could be let.

## SITE

The site is part of the Roebuck Gate area of Stevenage New Town. It slopes away from Turpin's Rise and use was made of the slope to provide for the split-level cross section, ie entrances to flats on all stairs landings.

## PLANNING AIMS

To provide attractive accommodation for post-graduate trainees, either single or married, at the most economical rent. The units are planned either as flats for a married couple, or for trainees each with their own rooms but sharing kitchen and bathroom. Considerable difficulty was experienced over the internal bathrooms without mechanical extract. It was resolved by reference to the paper produced by the Building Research Station on the natural ventilation of internal bathrooms, and by agreeing with the surveyor to the local authority, that the ventilation ducts would be in accordance with this paper and to the satisfaction of the Building Research Station. Fire precautions also provided a difficult problem because the fire brigade operates on country arrangements, which meant that alternative means of escape had to be provided from flats above the first floor. This has been done for the flats on the second floor by setting back the window panels adjacent to the central cross-wall and providing a knock-out panel in that cross-wall. The top flats have an escape door in each bathroom which gives access to the roof space and therefore to the staircases.





*The architects had difficulty with this plan in complying with a fire brigade regulation which required an alternative means of escape above the first floor. Centre flats on the second floor are therefore set back to give a "knock-out" panel in the cross-wall (see photograph) while top flats have an escape door in each bathroom to give access to the roof space and thence to the staircases*



*Plentiful vegetation on the lower slopes adjacent to the A1 helps to screen the building*



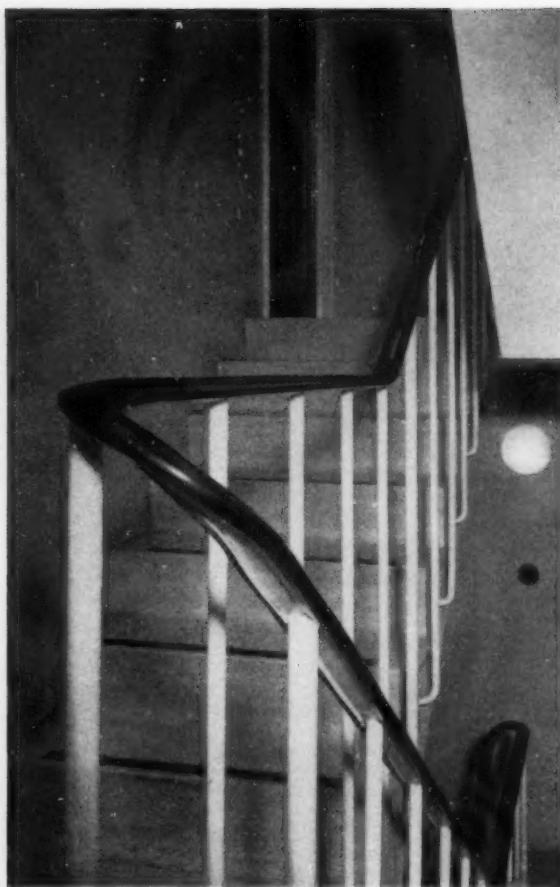
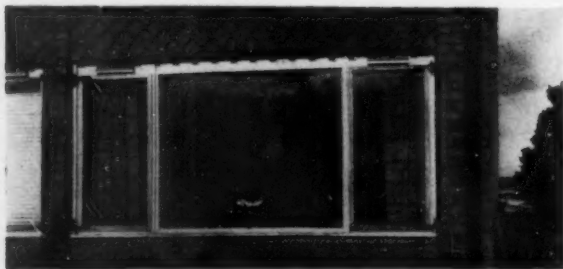


The flats seen from Turpin's Rise, partially obscured by a barrier of garages and service areas

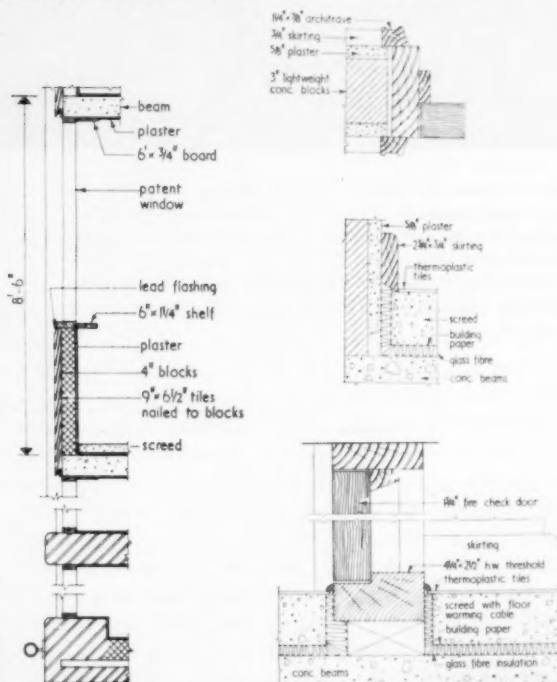


A screen wall separates garage and service areas from the flats to create a small walled garden immediately adjacent to the entrance. This is a very happy solution to a difficult problem

Three elements: cross-wall, window, and sub-sill panel give a simple expression to the cellular nature of the plan



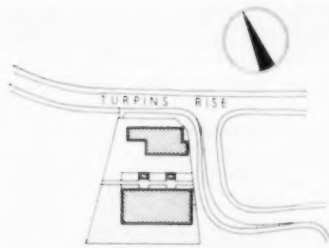
Two staircases linked at roof level give access to all upper floor flats. The omission of a skirting on these stairs has resulted in bad staining and surface abrasion



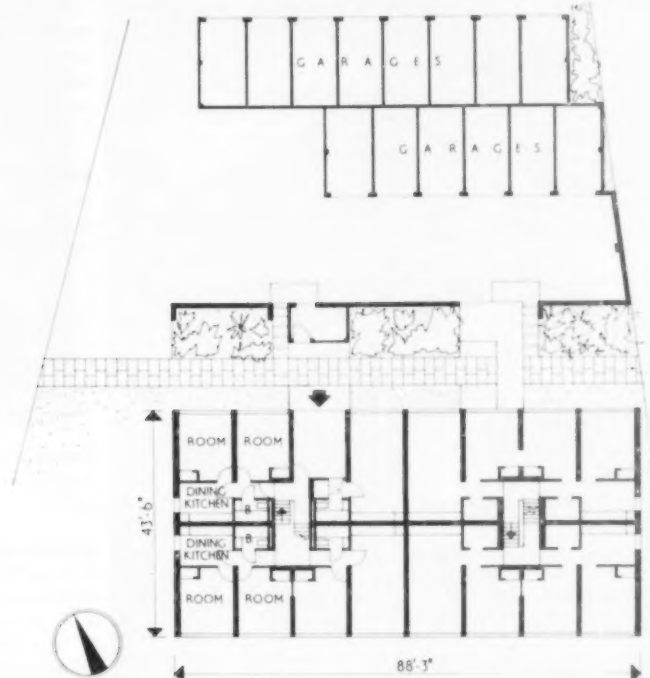
Plan of section through window walls of flats. Blue brick nosings are used on exposed ends of cross walls  
[Scale: 1/4" = 1' 0"]

Typical details of finishes. Top, frames and architraves of internal doors; centre, typical skirting detail; bottom, threshold of entrance doors to flats

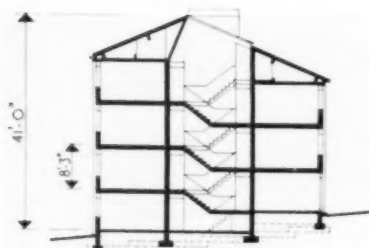




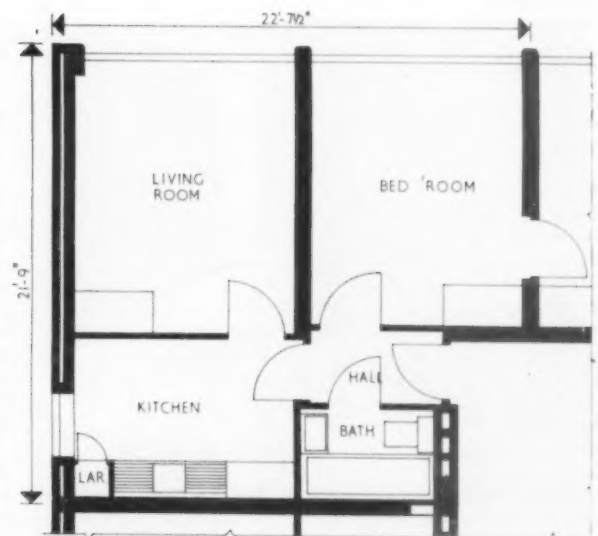
Block plan [Scale:  $\frac{1}{250}'' = 1' 0''$ ]



Floor plans, with ground floor plan on left and upper floor plan on right [Scale:  $\frac{1}{4}'' = 1' 0''$ ]



Section [Scale:  $\frac{1}{16}'' = 1' 0''$ ]



Plan of typical unit [Scale:  $\frac{1}{8}'' = 1' 0''$ ]



**SUMMARY**

Ground floor area: 3,626 sq ft.  
 Total floor area: 11,594 sq ft (net habitable area).  
 13,745 sq ft (gross floor area).  
 Type of contract: Negotiated.  
 Work began: September 1958.  
 Work finished: August 1959.  
 Final contract price of foundation, superstructure, installation and finishes including drainage to collecting manhole: £35,449 5s 7d.  
 Final contract price of external works and ancillary buildings, including drainage beyond collecting manhole: £4,597 15s 7d.  
 Total: £40,047 1s 2d.

**COST ANALYSIS**

Based on final contract price. (AJ revised elemental breakdown in use from November 10 1960)

Cost per  
sq ft

**Preliminaries and insurances**

9.02 per cent of remainder of contract.

**Work below lowest floor finish**

9-in and 15½-in wirecut brickwork on concrete foundations, 4-in concrete site slabs on hardcore, 2 damp-proof membrane and bituminous felt vertical damp-proof courses at change in floor levels.

**STRUCTURAL ELEMENTS****Upper floors**

6-in prestressed concrete beams; 553 sq yd, 36s 6d per sq yd.  
 6-in prestressed concrete beams; 57 sq yd, 37s 6d per sq yd.  
 6-in prestressed concrete beams in spans extending 17 ft; 280 sq yd, 49s 0d per sq yd.

**Roof**

Timber framed construction covered with felt, battens and concrete slates, softwood fascia and barge board with asbestos wood soffits, vitreous enamelled steel gutters and rainwater pipes.  
 Includes flooring of half the roof space with 1-in softwood boarding with asbestos insulation board under, and for an area of insulation board lining to walls. 444 sq yd, 101s 2d per sq yd.

**Rooflights**

Fixed aluminium section and wired cast glass; 15 sq yd 95s 3d per sq yd.  
 Opening galvanised frames and wired cast glass; 3 sq yd, 515s 1d per sq yd.

**Staircases**

Two 3 ft 6 in wide, total rise 30 ft 0 in.  
 In-situ reinforced concrete staircases and landings with terrazzo coverings to treads and risers and plaster soffits and outer strings, steel balustrade with plastic handrail.

**External walls**

External gable walls of cavity construction with half brick faced outer thickness and lightweight concrete block inner thickness; 268 sq yd, 76s 1d per sq yd.  
 Panels below windows infilling between cross walls, vertical tile hanging on 4-in lightweight concrete block wall; 210 sq yd, 73s 6d per sq yd.

**Windows**

Softwood frames, Agba casements, 32-oz clear sheet glass and ⅞-in drawn sheet glass; 2,826 sq ft, 11s 10d per sq ft.  
 Venetian blinds; 2,700 sq ft, 4s 11d per sq ft.

**External doors**

No of single: 2.  
 Glazed external doors with glazed side lights all in Agba glazed with ⅞-in drawn sheet and polished Georgian wired glass; 155 sq ft, 19s 10d per sq ft.

**Internal structural walls**

9-in brick in flettons; 938 sq yd, 41s 1d per sq yd.  
 9-in brick in flettons faced one side; 46 sq yd, 63s 7d per sq yd.  
 13½-in brick in flettons; 127 sq yd, 58s 8d per sq yd.

**Partitions**

3-in lightweight concrete blocks; 414 sq yd, 28s 0d per sq yd.

**Internal doors**

68 1½-in West African mahogany plywood faced both sides in softwood frames and architraves; 1,183 sq ft, 6s 9d per sq ft.  
 77 1½-in firecheck plywood faced both sides in softwood frames and architraves; 1,323 sq ft, 11s 6d per sq ft.

**Ironmongery**

Anodised aluminium door and window furniture, aluminium curtain track, plastic name plates.

Total of structural elements: 26s 10½d

**FINISHES AND FITTINGS****Wall finishes**

Plaster; 3,296 sq yd, 6s 10d per sq yd.  
 Wall tiling; 29 sq yd, 46s 3d per sq yd.

**Floor finishes**

Thermoplastic tile paving on cement/sand screed, building paper, chicken wire and glass fibre with softwood skirtings; 1,105 sq yd, 32s 4d per sq yd.

**Ceiling finishes**

¾-in tongued and grooved and v-jointed boarding on battens; 30 sq yd, 20s 9d per sq yd.  
 Skim coat on asbestos insulation including preparatory bonding coat; 343 sq yd, 22s 7d per sq yd.  
 Render and set concrete beam ceilings; 828 sq yd, 6s 11d per sq yd.  
 Plasterboard and skim coat; 19 sq yd, 10s 0d per sq yd.

**Decorations**

Ceilings twice whitened, walls two coats emulsion, wood and metalwork, two undercoats and one gloss finishing coat, hardwood, synthetic varnish.

**Fittings**

Wardrobes and meter cupboards 10d  
 Shelving 1½d  
 Kitchen cupboards 1s 10½d  
 Mirrors 1½d

4 0½ Total of finishes and fittings: 11s 8d

s d  
4 0½

3

4 2½

1 0

2 0

1 5½

2 1½

3 1

1 2½

2 2½

3 0

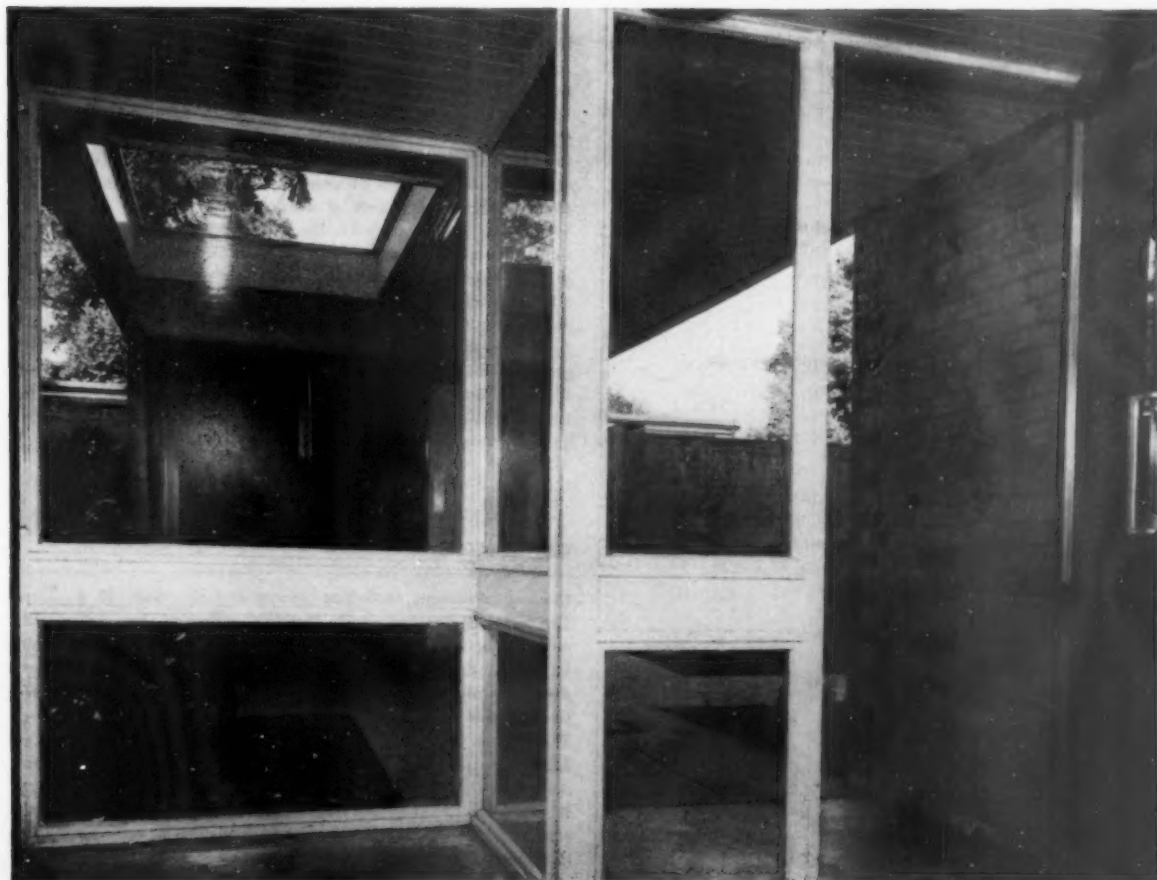




*Flats on the south face have fine views over the surrounding landscape. Decoration in the flats is sufficiently subdued to enclose a variety of furnishings. Underfloor electric heating is provided in all flats*

*Storage and drying areas within the roof space also act as a link between the two staircases*

*An extended canopy gives covered access between the entrance hall and a refuse storage area opposite*





## SERVICES

## Sanitary fittings

Type	No of each type
Stainless steel sink tops, 42 in × 18 in with pair ½-in chromium plated pillar valves:	28
22 in × 16 in white glazed earthenware lavatory basins with pair ½-in chromium plated pillar valves:	28
Low-level wc suites consisting of white glazed earthenware pan and trap, plastic seat and 2-gallon plastic flushing cistern:	28
White porcelain enamelled cast iron baths 5 ft 1 in long overall with pair ¾-in chromium plated pillar valves:	28

## Waste, soil and overflow pipes

Galvanised mild steel preformed soil pipes, preformed copper waste pipes, and resealing traps.

## Cold water services

Copper service pipes and capillary fittings.  
No of draw-off points: 112.  
Includes builder's work, 4½d.

## Hot water services

Copper service pipes and 25-gallon electric storage hot water tanks.  
No of draw-off points: 84  
Includes builder's work, ½d.

## Heating services

Electric under-floor heating.  
Metal-sheathed cables at 1½-in centres.  
Total load per flat 5 kW.  
Includes builder's work, 1½d.

## Ventilation services

9 in × 4½ in vertical ventilating ducts from each bathroom to roof in brickwork. (No fans.)

## Electrical services

Pvc cables in conduit.  
Outlets per flat: 4 power, 1 water heater, one cooker, 4 lighting, one shaving socket, tv socket (linked to master aerial) and telephone conduit.  
Delay relay time switches for stairs and dustbin store lighting.  
Total load: 7 kW per flat.  
Includes builder's work, 3½d.

## Drainage

Glazed stoneware branch drains and pitchfibre main runs.

## Total of services: 13s 7d

## External works

Glazed stoneware and pitchfibre drains, 2-in galvanised mild steel water mains, precast concrete flag paths, tarmacadam and grav. parking areas and 2 dustbin stores: 4s 5½d.  
14 garages: 3s 5½d.

## Total per sq ft of net habitable floor area:

£35,449 (net cost excluding external works)

11,594 sq ft (net habitable area)

## Cost per sq ft of gross floor area:

£35,449 (net cost excluding external works)

13,745 sq ft (gross floor area)

## COST COMMENT

This contract was negotiated in order to use a general contractor who was engaged in other work in the area, and therefore unit rates are probably slightly higher than those which would have been obtained from a competitive tender. On the other hand, of course, it is possible for the architect to offset this by avoiding unnecessarily expensive detailing through collaborative discussion with the contractor, and for the contractor to reduce his overheads by preplanning his operations on the certainty of carrying out the works.

A more serious influence on the cost of this contract is the general high level of prices in Stevenage (and in some of the other new towns). Preliminaries particularly tend to be large, in this case forming nearly 10 per cent of the total cost of the contract. This is apparently due to the relative shortage of skilled labour in the area, and to frequent loss of time through labour disputes. Thus the architect who is attempting to build within a severe cost limit, as in this case, finds the task specially difficult in this area. It is quite clear that this has had an overriding influence on the planning and detailing of the building, such as the choice of a fairly rigid system of cross-wall construction. There is also the absence of balconies and a very economical circulation system, so that the flats are about 85 per cent of the total floor area, in comparison with 77 per cent for the recently published example of Brecknock Road, London N1 (sfb (98): UDC 728.2, AJ 4.10.61). Thus although the cost per sq ft of gross floor area of this block at 51s 7d is higher than the figure of 49s 0½d for Brecknock Road, the cost per sq ft of net habitable area at 61s 0½d is well below the equivalent Brecknock Road figure of 63s 8d. Further comparison between these two blocks is of considerable interest, the main groups of elements being as follows:

Group of elements	Brecknock Road		Stevenage	
	s	d	s	d
Preliminaries etc, foundations	13	2½	9	0½
Structure	29	0	26	10½
Finishes and fittings	10	1½	11	8
Services	11	4½	13	7
Total	63	8	61	2½

2½ The main differences between the two analyses would appear to be:

4 9½ (a) Brecknock Road foundations were more expensive, due to building on a bombed site.

(b) the Brecknock Road analysis was based on tender, so that the first group in the table includes just over 2s for contingencies.

(c) The main saving at Stevenage in the structural elements is in the lower combined cost of windows and external walls, being 8s 1½d in comparison with 12s 4½d at Brecknock Road. This is due to the relatively high ratio of wall and window area to floor area at Brecknock Road, the inevitable result of an awkwardly shaped site and the need to develop a fairly complex block shape to meet the client's requirement of a form which would marry up satisfactorily with surrounding property. Many of the other items are very closely comparable. The two analyses together, bearing in mind the special conditions already mentioned, can therefore provide a useful guide to cost planning this type of dwelling in load-bearing brickwork.

7 11

## CONTRACTORS

General contractor, including joinery and electrical: H. C. Janes Ltd. Sub-contractors and suppliers—Precast and prestressed hollow concrete beam floor construction: Gurlings Ferro Concrete Ltd. and Square Grip Reinforcement Co Ltd. Thermoplastic floor tiles and concrete paving: Marley Tile Co Ltd. Rooflights: Greenwoods & Airvac Ventilating Co Ltd. Rooflight glazing: Williams & Williams Ltd. Slate sills: Bow Slate & Enamel Co Ltd. Terrazzo paving: Zanelli (London) Ltd. Venetian blinds: Avery & Co Ltd. Kitchen fittings: Kandya Ltd. Ironmongery: K. S. Neale Ltd. Curtain tracks: Silent Gliss Ltd. Soil and waste stacks: Econa Modern Products Ltd. Sanitary fittings: Kennedy's (Builders' Merchants) Ltd.



# AJ SfB (2)

## Structures : General



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*Herbert Wilson, MICE, author of this week's Element Design Guide and Technical Study, is a chartered civil engineer and a partner in the firm of Norman and Dawbarn, architects and consulting engineers*

*(2) Structures: General*

This week's Element File differs slightly in function from previous files in the series. Readers will note that the list of elements on the Journal cover contains three specific structural elements: (2) *Structures: Concrete: General*

(2) *Structures: Sections, metal*

(2) *Structures: Sections, wood*

This Element Design Guide is intended to prepare the way for these later files (which will appear out of sequence at the end of the series), to gather the data required for further consideration of structure, and to enable the architect to take basic decisions on the form and material of structural system.

The EDG includes appointment of the structural consultant and takes the architect to the stage where the consultant is given his secondary brief to prepare in detail the chosen structural system. From this point one of the three subsequent structural EDGs will be used.

One of the advantages of the present EDG is that its use will induce at an early stage in design a structural discipline and a more precise use of structural terminology which will enable the architect to communicate more readily with his consultant. It will also establish a proper structural relationship between other structural elements which are considered in detail in subsequent Element Files. This week's Element File also contains four Information Sheets on surface structures.



**AJ****SfB (2)**

Element Design Guide

UDC 624.9 (2) Structures: General

## (2) Structures : General

Bibliographic references (third column) are graded as follows:

\* General reference of value to every architect and which he may wish to possess

\*\* Specialised reference normally used by consultant or architects with special knowledge of particular aspects of building

\*\*\* Highly specialised references and research papers which would not be of value to the architect unless working with a consultant

Figures in square brackets are SfB references to the publications. References in **bold type** are to AJ Element Files

### Data required

1 Obtain preliminary site information	SUBSOIL TOPOGRAPHY EARLIER USERS OF SITE ADJACENT PROPERTIES (position and condition)	<b>SfB (11) Ground : General</b> Element Design Guide BRITISH STANDARDS INSTITUTION *CP 2001:1957 Site investigations [Ca]. <i>These investigations must be supported as necessary by full scale site exploration at a later stage under the direction of structural consultant</i>
2 Note environment	CLIMATE: rainfall—seasonal distribution prevailing winds  temperature range relative humidity  SOURCES OF NUISANCE: fumes, dirt, vibration, noise ACCESSIBILITY FOR: normal vehicular traffic, contractor's plant, large building components, large industrial plant	*METEOROLOGICAL OFFICE Averages of rainfall for Great Britain and Northern Ireland 1916-50. 1958, HMSO [Aa9] *METEOROLOGICAL OFFICE Averages of temperature for Great Britain and Northern Ireland 1921-50. 1953, HMSO [Aa9] <i>Check special circumstances where structure is adjacent to industrial processes</i>
3 Consider break-down of total volume	UNITARY CELLULAR COMPOSITE according to: function of building, architectural brief	
4 Consider definition of volume  IN HORIZONTAL PLANE   IN VERTICAL PLANE	WALLS: external internal CHANGES OF LEVEL IMPLIED DEFINITION FLOORS: in contact with ground suspended ROOFS: exposed working platform storage platform shelter	<b>SfB (21) Walls, External loadbearing: General</b> <b>SfB (22) Partitions: General</b>  <b>SfB (23) Floors, ground: General</b> <b>SfB (23) Floors, structural: General</b> <b>SfB (26) Roofs, structural, flat: General</b> <b>SfB (27) Roofs, structural, pitched: General</b> *ANGERER, F. Surface structures in building. London, 1961, Tiranti [Ab3]
5 Determine limiting spatial dimensions	HORIZONTAL AND VERTICAL Architectural brief User requirements Spatial function	
6 Consider structural interpretation of spatial, physical and aesthetic needs	ENCLOSURE AND SHELTER: below ground above ground mobile or suspended	*CASSIE, W. F. & J. H. NAPPER Structure in building. London, 1952, Architectural Press [(2)] *LISBORG, N. Principles of structural design. London, 1961, Batsford pp 37-61 [Ab3]



	<p>ARCHITECTURAL OBJECTIVE: eg symbolic monumental functional</p> <p>SCALE</p>	*ANGERER [Ab3]
7 Determine limitations imposed by design components	<p>Structurally exploitable or requiring structural expedients:</p> <p>HORIZONTAL eg tunnels corridors bridges</p> <p>travelators</p> <p>VERTICAL eg lifts hoists flues</p> <p>COMPOSITE eg staircases, ramps escalators chutes</p>	<p>**BS 153 Steel girder bridges [(91)]</p> <p>**MINISTRY OF TRANSPORT Specification for road and bridge works. 1957, HMSO [(91)]</p> <p>*GOFF, A. Moving pavements, AJ, January 5 1961, pp 18-19 [(66)]</p> <p>*BS CP 407.101:1951 Electric lifts [(66)]</p> <p>*BS CP 407.301:1950 Hand-power lifts [(66)]</p> <p><b>SfB (24) Stairs and ramps: General</b></p>
8 Consider life span of building	<p>TEMPORARY: expendable, salvageable, demountable for re-use</p> <p>LIMITED useful life</p> <p>PERMANENT</p> <p>Check possible future changes in use of building, including future extensions—<i>vertically, horizontally</i></p>	
9 Determine structural demands of contents	<p>SUPPORT</p> <p>PROTECTION of users, building, plant, equipment; <i>from climate, vibration, noise, radiation</i></p>	
10 Determine structural demands of services STORAGE	<p>Fluids: <i>water</i> <i>oil</i> <i>petrol</i></p> <p>Gases</p> <p>Solids: <i>fuels; waste products</i></p>	<p>*BP CP 3: Chap VII: 1950 Engineering and utility services [Ab8]</p> <p>*BS CP 310:1952 Water supply [(53)]</p> <p>*LONDON COUNTY COUNCIL Oil fuel installations. Code of practice for the guidance of applicants in LCC construction of buildings in London, p. 245 [Aa6]</p>
DISTRIBUTION, DISPOSAL AND EXHAUST	<p>Ducts and pipes: <i>vertical, horizontal, internal, external, above ground, below ground</i></p> <p>Hoists</p> <p>Chutes</p> <p>Corrosive: <i>fluids, gases</i></p> <p>Explosives</p> <p>Radiation</p>	<p>*BS CP 413:1951 Design and construction of ducts for services [(11)]</p>
HAZARDS		<p>*FACTORIES ACT 1937 clause 28 [Aa5]</p> <p>**IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY Code of practice against radiation hazards. London, 1960 [Ab9]</p>
11 Determine statutory minimum loading	<p>DEAD</p> <p>IMPOSED</p> <p>WIND</p>	<p>*MINISTRY OF HOUSING AND LOCAL GOVERNMENT Model byelaws, Series IV Buildings, 1953 edition clauses 18(2), 21(2) and second schedule. HMSO [Aa6]</p> <p>*LONDON COUNTY COUNCIL London building (constructional) by-laws, PART II. 1952, LCC. [Aa6]</p> <p>*DEPARTMENT OF HEALTH FOR SCOTLAND Model building byelaws 1954 (reprinted 1957): Burghs: 16-19 and tables 1-3. Counties: 22-25 and tables 1-3. HMSO [Aa6]</p> <p><i>See also</i></p> <p>*BS 648:1949 Schedule of weights of building materials [Ab4]</p> <p>*BS CP 3: Chap v: 1952 Loading, clauses 7-12 and appendix 3 (wind loading) [Ab4]</p>



<p><b>12 Determine special loading</b></p> <p>STATIC CONDITIONS</p> <p>DYNAMIC CONDITIONS</p>	<p>Assess building user's loading requirements where these exceed statutory loadings</p> <p>Check possible future changes in use of building, including future extensions, vertically or horizontally</p> <p>Make preliminary assessment of special loadings: <i>storage areas; plant areas; machine loads; areas loaded during installation of plant and machines; vehicular loading</i></p> <p>List of all known moving or dynamic loadings:</p> <p>Cranes, hoists and lifting machinery</p> <p>Reciprocating machines: <i>balanced, unbalanced eg printing machines with racking forces</i></p> <p>Testing machines: <i>check for impact loading on test failure; check for special vibrations and fatigue effects</i></p> <p>Vehicular traffic</p>	<p>*BS 648:1949 [Ab4]</p> <p>*BS CP 3: Chap v: 1952 [Ab4]</p> <p>*BLAKE, F. H. Building and structural tables. London, 1947, Chapman and Hall [Ab4]</p> <p>*BS CP 3: Chap v: 1952 [Ab4]</p> <p>*BS 449:1959 The use of structural steel in building [(2)Hd2]</p> <p>*BUILDING RESEARCH STATION Digest 78 (first series) Vibrations in buildings. 1955 [Ab9]</p>
<p><b>13 Consider erection requirements and determine their likely effect on structural form</b></p>	<p>SPEED</p> <p>CONFINED SITE</p> <p>PHASED ERECTION: vertically horizontally</p>	<p>Ascertain from—site survey, client requirements and availability of labour and materials</p>
<p><b>14 Determine statutory fire requirements</b></p>	<p>Classification and duration of fire resistance period</p> <p>Spread of fire and protection</p> <p>Means of escape</p>	<p>POST-WAR BUILDING STUDIES</p> <p>*No 20 Fire grading of buildings: part I. 1946, HMSO [Ab9]</p> <p>*No 29 Fire grading of buildings: parts II, III, and IV. 1949, HMSO [Ab9]</p> <p>*FIRE PROTECTION ASSOCIATION <i>Journal</i> Reprint No 5. Fire resistance grading of elements of structure. London, 1952, The Association [Ab9]</p> <p>*Model byelaws 34-49 [Aa6]</p> <p>*LCC By-laws part ix [Aa6]</p> <p>*Scottish model building byelaws—Burghs: 29-42 and table 12 [Aa6]</p> <p>Counties: 35-48 and table 12 [Aa6]</p> <p>*MINISTRY OF EDUCATION Building Bulletin No 7. Fire and the design of schools. 1961, HMSO [Ab9]</p> <p>*LONDON COUNTY COUNCIL Means of escape in case of fire, 1954, No 3836. Code of practice for guidance of applicants [Ab9] (incorporated in LCC Construction of buildings in London, 1957, No 3954)</p> <p>*Scottish model building byelaws—Burghs: part vi [Aa6]</p> <p>Counties: part vii [Aa6]</p> <p>*MOE Building Bulletin No 7 [Ab9]</p> <p>FACTORIES ACT 1937 clauses 34-36 [Aa5]</p>
<p><b>15 Determine planning requirements</b></p>		<p>TOWN AND COUNTRY PLANNING ACT 1947 [Aa5]. Administered by planning officers of county boroughs and county councils</p>
<p><b>16 Cost</b></p>	<p>Make preliminary estimates of breakdown of major building elements so that parameters of cost of the structural element can be roughly defined</p> <p>Estimate relationship between capital cost and maintenance costs per annum</p> <p>Check with client any specialist knowledge of maintenance costs</p>	
<p><b>17 Prepare programme</b></p>	<p>PRIMARY BRIEFING PERIOD</p> <p>selection and appointment of structural consultant</p> <p>preparation of consultant's primary brief</p> <p>SKETCH SCHEME, PRELIMINARY DESIGN AND ESTIMATES</p> <p>the formative stage when the consulting engineer can provide valuable advice and assistance</p>	



	<p>SECONDARY BRIEFING PERIOD</p> <p>the architect has now passed the formative stage and can further instruct the consultant who will then have sufficient information to develop his basic structural schemes and proceed to detail design</p> <p>FINAL DESIGN, ESTIMATES AND APPROVALS</p> <p>WORKING DRAWINGS</p> <p>BILLING AND TENDERING</p> <p>CONSTRUCTION</p>	
18 <b>Primary brief</b>	<p>Prepare consultant's primary brief using paras 1 to 16 as a framework</p> <p>Select and appoint structural consultant</p>	<p>*BS CP 114:1957 Clause 101 [(2)Eq4] recommends appointment of chartered structural or civil engineers.</p> <p>Institution of Civil Engineers, Great George Street, London, SW1</p> <p>Institution of Structural Engineers, 11 Upper Belgrave Street, London SW1</p>

### Consideration of form

19 <b>Foundations</b>	<p><i>The selection of a foundation structure is, with the exception of simple structures on very good foundation material, a matter for the consultant</i></p> <p>Obtain preliminary assessment of suitable foundation structures and determine degree of influence form of foundation will have on form of structure</p> <p>In certain conditions this influence may be considerable, for example:</p> <p>Simple structures having foundations on:</p> <p><i>shrinkable clays</i></p> <p><i>made-up ground or filling</i></p> <p>Structures in which foundation loads have to be concentrated in limited areas</p> <p>Structures in which foundation loads have to be spread over large areas</p> <p>Structures in which tolerable settlement is:</p> <p><i>smaller than normally acceptable</i></p> <p><i>larger than normally acceptable</i></p> <p>Structures in which differential settlement is a major problem</p> <p>Structures in subsidence areas</p>	<p><b>SfB (16) Foundations: General</b> EDG para 9</p> <p>*LISBORG p 55 [Ab3]</p> <p>*CASSIE AND NAPPER p 143 [(2)]</p> <p>*MANNING, G. P. Design and construction of foundations. London, 1961, Concrete Publications Ltd [(16)]</p> <p>*ICE CP No 4: 1954 Foundations [(16)]</p> <p>*BS CP 2003:1939 Earthworks [C]</p> <p>**HENRY, F. D. C. Design and construction of engineering foundations. London, 1956, Spon [(16)] o/p, to be reprinted</p> <p>*BRS Principles of modern building, vol 1, 1959, 3rd edition, chap 17 p 232-233. HMSO [Bb]</p> <p>*BRS Digest No 3 (first series) House foundations on shrinkable clays. 1949 [(16)]</p> <p>*BRS Digest No 9 (first series) Building on made-up ground or filling. 1960 [(16)]</p> <p>**SKEMPTON, A. W. and D. M. MACDONALD The allowable settlement of buildings. Proceedings of the ICE 1956, part III 5 (3) (December), p 727-784</p> <p>**Report on mining subsidence and its effect on structures. Institution of Structural Engineers, 1949</p> <p>*MOE Building Bulletin No 19 The story of CLASP, 1961, HMSO [(97)]</p>
20 <b>CONSTRUCTIONAL FACTORS</b> <b>Structural subdivisions</b>	<p>Determine limits of structural sub-divisions as conditioned by:</p> <p><i>shrinkage and thermal effects</i></p> <p><i>transmission of noise and vibration</i></p> <p><i>spread of fire</i></p> <p><i>differential settlement</i></p> <p><i>subsidence</i></p> <p><i>separation of dissimilar structural systems</i></p>	<p>*LISBORG p 160 [Ab3]</p> <p>*PARKIN, P. H. and H. R. HUMPHREYS. Acoustics, noise and buildings, chap 7 and 8. London, 1958, Faber and Faber [Ab9]</p> <p>see para 14 above</p> <p>**HENRY p 200 [(16)]</p> <p><b>SfB (16) Foundations: General</b> EDG para 25</p>



21 <b>Strength and rigidity</b>	<p>Determine any special demands on structural strength and stability:</p> <p>establish limits for structural deformations in vertical or horizontal planes as conditioned for example by: <i>optical measuring instruments, precision machinery, testing machines, fluid containers</i></p> <p>define all areas in which heavy static loading is combined with dynamic effects. <i>Note that under these conditions the constructional system may require to be heavy to minimise acceleration and stiff to minimise displacements. Special investigation is required to deal with problems of flutter and vibration, as related to special loading conditions and natural frequency of the building</i></p>	<p><i>Ascertain from client or specialist consultant</i></p> <p>***NORRIS, C. H., and others: Structural design for dynamic loads. New York, 1959, McGraw Hill [Ab4]</p> <p>***CROCKETT, J. H. A. Vibration control in machine foundation. <i>Reinforced Concrete Review</i> 1960, 5 (6) (June), p 329-367 [(33)]</p> <p>These problems may arise in connection with:</p> <p><i>very tall buildings, long-span structures, structures subjected to earthquakes or to shock loads producing effects similar to earthquakes, eg large forging hammers, drop stamps, etc</i></p>
22 <b>Future extensions</b>	<p>Determine structural implications of future extensions:</p> <p><i>additional loading</i>  <i>continuity of structure</i>  <i>differential settlement</i>  <i>profile of members</i>  <i>continuity of services</i></p>	
<b>FUNCTIONAL FACTORS</b> 23 <b>Relate space and structure in vertical dimension</b>	<p>Space available to user as conditioned by:</p> <p>FUNCTION          ARCHITECTURAL BRIEF</p> <p>Space available for structural use as conditioned by:</p> <p>NATURAL ILLUMINATION          ARTIFICIAL ILLUMINATION          SERVICE DISTRIBUTION SYSTEMS          FUNCTIONAL CEILINGS: <i>insulation, thermal and acoustic; heating; illumination</i></p> <p>Continuity of structural form as conditioned by load flow pattern vertically to foundations</p>	<p><b>SfB (37) Roof-lights and traps etc: General</b></p> <p><b>SfB (25) Ceilings, suspended: General</b></p>
24 <b>Relate space and structure in horizontal dimension</b>	<p>Limits of areas to be free of internal structural elements</p> <p>Limits of areas available for perimeter load-carrying system as conditioned by:</p> <p>NATURAL ILLUMINATION          SERVICE DISTRIBUTION SYSTEMS          EXPOSED, EXPRESSED OR SUPPRESSED STRUCTURAL FORM</p> <p>Continuity of structural form as conditioned by load flow pattern horizontally</p>	<p><b>SfB (31) Windows: General</b></p>
<b>STRUCTURAL FACTORS</b> 25 <b>Basic structural system</b>	<p>Determine link between structural system and spatial demands and establish basic construction:</p> <p>SOLID CONSTRUCTION</p> <p>SKELETON CONSTRUCTION: frame and slabs but with space enclosed by non-loadbearing panels. Skeleton to be: <i>exposed, expressed, suppressed</i></p> <p>SURFACE CONSTRUCTION: space contained by the structure as a three-dimensional entity</p> <p>SUSPENSION STRUCTURES</p>	<p>*BRS Principles of modern building, vol 1 [Bb]</p> <p>*LISBORG, p 37 et seq [Ab3]</p> <p>*CASSIE and NAPPER p 195 [(2)]</p> <p>AJ Information Sheet No 1031 [(2)]</p> <p>*ANGERER [Ab3]</p>
26 <b>Vertical structural system: perimeter loading</b> CONSIDERATIONS	<p>Loading</p> <p>Foundations</p> <p>Lateral stability</p> <p>Climate</p> <p>Cost</p> <p>Speed of erection</p>	<p><b>SfB (16) Foundations: General</b> EDG</p> <p>Foundation Selection, paras 14-20</p>



TYPES	Site Lighting and ventilation  Solid wall Pierced wall Column grid with infill panels Multi-strut column grid Prefabricated framed wall	<b>SfB (31) Windows: General</b>
<b>27 Vertical structural system: interior loading</b>  CONSIDERATIONS          TYPES	Loading Planning requirements Foundations  Lateral stability Cost Speed of erection Cross wall Spine wall Diaphragm wall   Column grid Tower structure: ducts, lift shafts, stairs	<b>SfB (16) Foundations: General</b> EDG Foundation Selection, paras 14-20   <i>The loadbearing wall is limited as a structural system to:</i> <i>Single storey structures</i> <i>Multi-storey structures of constant floor form with modest spans</i> <i>Auxiliary structures in conjunction with a skeleton structure and forming cross walls, spine walls, diaphragms and tower structures</i>
<b>28 Horizontal structural system</b>	Determine in conjunction with 26 and 27 above the horizontal structural systems: slabs and hybrid constructions spanning in one direction slabs with beam systems slabs spanning in two directions without beam systems	
<b>29 Continuity</b>	Check continuity of structural form as conditioned by load flow pattern vertically and horizontally Isolate and re-examine any discontinuities of structural form	
<b>30 Stability</b>	Check general stability of structure as a whole with special reference to horizontal loading	<b>*LISBORG</b> , pp 19 and 235 [Ab3]
<b>31 MAINTENANCE</b>	Determine cycle of maintenance for various materials relative to local conditions Check special problems of accessibility for maintenance and note possible built-in structural aids	

### Basic structural design

<b>32 Appraisal</b>	Having agreed with the structural consultant a basic structural system, planning adjustments necessitated by this choice should be made and practicability of chosen system finally determined Structural forms selected should now be considered in greater detail, especially in relation to other elements	<b>SfB (13) Retaining structures</b> <b>SfB (16) Foundations: General</b> <b>SfB (21) Walls: External loadbearing: General</b> <b>SfB (23) Floors, ground: General</b> <b>SfB (23) Floors, structural: General</b> <b>SfB (24) Stairs and ramps: General</b> <b>SfB (26) Roofs, structural, flat: General</b> <b>SfB (27) Roofs, structural, pitched: General</b>
<b>33 Consider structural system in detail</b>	Structural requirements: LOADING STABILITY FOUNDATION Statutory requirements Cost Speed of erection Durability	



	Maintenance Services	
34 <b>SOLID STRUCTURES</b>	<p>Consider suitability of construction method:</p> <p>UNIT CONSTRUCTION:  <i>brick</i>  <i>block</i></p> <p>IN-SITU CONSTRUCTION:  <i>mass concrete</i>  <i>lightweight concrete</i>  <i>no fines concrete</i>  <i>sand-cement mortar (ferro-cement)</i>  <i>reinforced concrete</i></p> <p>PREFABRICATED CONSTRUCTION</p>	<p>*BS CP 111:1948 Structural recommendations for loadbearing walls [(21)]</p> <p>*BS CP 121.101:1951 Brickwork [Fg]</p> <p>*BS CP 121.201:1951 Masonry walls ashlar with natural or with cast stone [Fe]</p> <p>*BS CP 123.101:1951 Dense concrete walls [(21)Eq4]</p>
<b>SKELETON STRUCTURES</b>		<i>The skeleton is built up from individual elements acting in a linear sense only which can be used in two- or three-dimensional frames</i>
35 <b>Type</b>	<p>Determine type of skeleton construction:</p> <p>PIN-JOINTED, in which all joints between individual units are considered to be hinged and rigidity is ensured by one of the following: <i>rigid panels built into frame</i>  <i>auxiliary members</i>  <i>auxiliary frames</i></p> <p>SEMI-RIGID, in which some joints are capable of taking partial moments</p> <p>FULLY RIGID, in which all joints are capable of carrying all design moments. The structure behaves as a monolithic frame and full advantage is taken of modern methods of design</p>	<p>*LISBORG p 37 [Ab3]</p> <p>*MEHARDY YOUNG, J. Structural theory and design. London, 1950, Crosby Lockwood [Ab3] o/p</p> <p>*GRAY, C. S., KENT, L. E., MITCHELL, W. A., GODFREY, G. B. Steel designer's manual. London 1960, Crosby Lockwood, 2nd edition [(2)Hd2]</p> <p>*REYNOLDS, C. E. Reinforced concrete designer's handbook. London, 1961, Concrete Publications Ltd. [(2)Eq4]</p> <p>**WALLEY, F. Prestressed concrete. Design and construction. 1953, HMSO [(2)Gf2]</p>
36 <b>Material</b> NORMAL REINFORCED CONCRETE	<p>Cement:  <i>portland (ordinary and rapid hardening)</i>  <i>portland blast furnace</i>  <i>high alumina</i></p> <p>Aggregates:  <i>from natural sources</i>  <i>manufactured</i></p> <p>Reinforcement:  <i>rolled steel bars or hard-drawn bar</i>  <i>cold twisted steel bars</i>  <i>steel fabric</i>  <i>special reinforcements</i></p> <p>Construction method  <i>in-situ</i>  <i>prefabricated</i>  <i>combined</i></p>	<p><b>SfB (2) Structures: Concrete: General</b></p> <p>*BS CP 114:1957 The structural use of reinforced concrete in buildings [(2)Eq4]</p> <p>**SCOTT, W. L., GLANVILLE, W. and THOMAS, F. G. Explanatory handbook on BS CP 114. London, 1961, Concrete Publications Ltd. [(2)Eq4]</p> <p>AJ Information Sheet No 1031 [(2)]</p>
PRESTRESSED	<p>Tendons:  <i>plain hard-drawn steel wire</i>  <i>indented or crimped hard-drawn steel wire</i>  <i>high tensile steel bars</i>  <i>stranded cables</i></p> <p>Anchorage:  <i>bond</i>  <i>wedges</i>  <i>screwed nuts</i>  <i>proprietary forms</i></p> <p>Construction method:  <i>in-situ—pre-tensioned</i>  <i>in-situ—post-tensioned</i>  <i>prefabricated—pre-tensioned</i>  <i>prefabricated—post-tensioned</i></p>	<p>*BS CP 115:1959 Prestressed concrete [(2)Gf2]</p> <p>**WALLEY, F. W. and S. C. C. BATE A guide to the BS code of practice for prestressed concrete No 115:1959. London, 1961, Concrete Publications Ltd. [(2)Gf2]</p>



## STEEL

## Material:

*medium tensile*  
*high tensile*

## Form:

*rolled steel sections and plates*  
*hollow circular and rectangular sections*  
*cold formed steel sections*  
*castings*  
*forgings*

## Connection:

*pins*  
*bolts, black and precision*  
*rivets*  
*high-strength friction grip bolts*  
*welding*

## ALUMINIUM ALLOYS

## Form:

*sheets*  
*castings*  
*extrusions*  
*rolled sections*  
*cold formed sections*  
*forgings*  
*stampings*

## Connection:

*pins*  
*bolts*  
*rivets*  
*welding*  
*adhesive*

## TIMBER

## Form:

*natural scantlings*  
*built-up units, laminated and glued*

## Connection:

*carpentry joints*  
*nails*  
*screws*  
*bolts*  
*connectors*  
*adhesive*

## PLASTICS

Of limited present use but high future potential

## Available as:

*composite material in built-up units*  
*joints and bushes*  
*stressed skin construction*

## COMPOSITE

## CONSTRUCTION

Structural steel and reinforced concrete:

*prefabricated and in-situ concrete*  
*prestressed and normal in-situ concrete*  
*steel armature and sand/cement mortar*

SURFACE  
STRUCTURES

## 37 Type

SLABS AND  
PANELS

Most structural materials can be used; the most usual are:  
*reinforced concrete flat slab or plate floors; steel and alloy*  
*plates used as tanks, bunkers and containers; reinforced*  
*concrete deep beams or panels*

SINGLE  
CURVATURE  
STRUCTURES

*Barrel shell—supported between end stiffening ribs*  
*Barrel vault—supported by longitudinal edge members (these*  
*may be integral with the vault)*  
*Transverse shell—of smaller width in relation to span*

## SfB (2) Structures: Sections, metal

\*BS 449:1959 The use of structural steel in building [(2)Hd2]

\*\*BS 15:1948 Structural steel [Hd2]

\*BRITISH CONSTRUCTIONAL STEELWORK ASSOCIATION: Safe load tables, 1960 [(2)Hd2]

\*BS CP 113:201:1953 The structural use of steel tubes in buildings (incorporated in BS 449) [(2)Hd2]

## SfB (2) Structures: Sections, metal

\*\*NORTHERN ALUMINIUM CO LTD. Structural Aluminium, 1956 [(2)Hd4]

\*DE MARE, E. New ways of building, p 205. London, 1958, Architectural Press [Aa2]

\*Structural use of aluminium alloys in buildings. London, 1950, Institution of Structural Engineers [(2)Hd4]

\*BS 1161:1951 Aluminium and aluminium alloy sections [Hd4]

## SfB (2) Structures: Sections, wood

\*BS CP 112:1952 The structural use of timber in buildings [(2)Hil]

\*LISBORG p 262 et seq [Ab3]

\*DE MARE [Aa2]

\*REECE, P. O. An introduction to the design of timber structures. London, 1949, Spon [(2)Hil]

\*\*PEARSON, R. G. KLOOT, N. H. and BOYD, J. D. Timber engineering design handbook. Melbourne, 1958, Melbourne University Press [(2)Hil]

\*DE MARE, p 222 [Aa2]

\*\*\*VIEST, I. M., FOUNTAIN, R. S. and SINGLETON, R. E. Composite construction in steel and concrete for bridges and buildings. New York, 1958, McGraw Hill [(2)]

\*ANGERER [Ab3]

\*\*\*CHRONOWICZ, A. Design of shells. London, 1960, Crosby Lockwood [(2)]  
AJ Information Sheet No 1027 [(2)]

*In multi-cellular structures, only flat surface elements (in which elastic behaviour is considered two-dimensionally) such as slabs and panels can be used, but such elements can be combined with solid or skeleton structures*

AJ Information Sheet No 1028 [(2)]



<p>DOUBLE CURVATURE STRUCTURES</p> <p>FOLDED STRUCTURES</p>	<p>Longitudinal shell—<i>of greater width in relation to span</i> North light shells Intersecting barrel shells Conoidal shells</p> <p>Rotational shells Transitional shells Hyperbolic paraboloids and derivative shapes</p> <p>Prismatic—<i>flat panels</i> Pyramidal—<i>triangular flat panels</i> Semi-prismatic Conical folds Folded frames Folded arch</p>	<p>*ANGERER p 50 et seq [Ab3] AJ Information Sheet No 1029 [(2)]</p> <p>*ANGERER p 67 et seq [Ab3] *MAKOWSKI, Z. S. Stressed skin space grids. <i>Arch. Design</i>, 1961, 31 (7) (July), p 323-327 [(2)] AJ Information Sheet No 1030 [(2)]</p>
<p>38 <b>Material</b></p>	<p>Reinforced concrete: <i>in situ, prefabricated, prestressed</i> Timber</p> <p>Steel and alloys Composite: <i>steel armature and cement/sand mortar; steel armature and plastics</i></p>	<p>*ANGERER [Ab3] *TOTTENHAM, H. and C. HUME. Structural shells in timber [(27)Hi]: 1. Historic development and present economic position. AJ October 11 1961, p 603 2. The geometry of shells. AJ October 18 1961, p 665 3. The geometry of shells (concluded). AJ November 1 1961, p 819 4. Recent examples in this country. AJ November 8 1961, p 887</p>
<p>39 <b>SUSPENSION STRUCTURES</b></p>	<p>Specialised roof forms composed of three main structural elements:</p> <p>FLEXIBLE TENSION MEMBERS AND BRACING MEMBERS: high tensile wires; stranded cables COMPRESSION RINGS AND ANCHORAGES: reinforced concrete; steel ENVELOPING MEMBRANE: wire mesh; wire mesh with cement/sand mortar; precast concrete and lightweight concrete slabs; metal slab units; plastic slabs or sheeting</p>	
<p><b>PROVISIONAL DESIGN</b> 40 <b>Collate loadings</b> VERTICAL</p> <p>HORIZONTAL</p> <p>BENDING MOMENTS</p>	<p>Column loads Wall loads Floor loads Negative loads</p> <p>Retaining walls; basement walls; arch and frame thrusts; inclined columns; wind Retaining walls; basement walls; arch and frame reactions; fixed ended columns; cantilever slabs and beams</p> <p>} <i>dead and live</i></p>	
<p>41 <b>Fire resistance</b></p>	<p>Check fire resistance of structural element</p>	
<p>42 <b>Cost</b></p>	<p>Make provisional estimate of cost of structural element and check with target cost</p>	
<p>43 <b>Consultant's secondary brief</b></p>	<p>By this stage the architectural objective should be clearly expressed and all major decisions made concerning form, construction, materials and cost</p> <p>The consultant proceeds to detailed design stage and his original brief must be reconsidered, amended, enlarged and reissued</p> <p>Resulting from parallel developments concerning other specialists (eg heating and ventilating consultants) the architect must embody in the structural consultant's secondary brief all matters having structural implications. He must make sure that consultants are fully informed at all times and if necessary initiate programme of regular co-ordination meetings</p>	



Consultant's secondary brief should cover:  
 STRUCTURAL SYSTEM: *loading; material; planning dimensions*  
 ERECTION REQUIREMENTS: *speed of erection; construction method; phasing*  
 DESIGN LIFE  
 COST  
 STATUTORY REQUIREMENTS  
 SITE: *survey; climate*  
 SOIL MECHANICS REPORT  
 INTEGRATION WITH SERVICES  
 PROGRAMME  
 TYPE OF CONTRACT

## Appendix A DEFINITIONS

The following list is not comprehensive but includes general terms subject to misinterpretation and misuse

For fuller definitions see:

\*BS 1991: Part 1: 1954 Letter symbols, signs and abbreviations. General [Aa1]

\*BS 2787: 1956 Glossary of terms for concrete and reinforced concrete [Aa1]

<b>Subsoil</b>	General term for material below organic topsoil
<b>Foundation</b>	Structure which transmits forces to subsoil
<b>Substructure</b>	All structure below general ground level
<b>Superstructure</b>	All structure above general ground level
<b>Settlement</b>	Reduction in foundation level due to chemical or physical changes to subsoil under load
<b>Heave</b>	Increase in foundation level due to chemical or physical changes arising from external conditions
<b>Subsidence</b>	Changes in foundation level and position due to spatial changes in subsoil
<b>Deformation</b>	Dimensional changes in structures caused by load, temperature or chemical conditions
<b>Stress</b>	Force expressed as load per unit area
<b>Strain</b>	A ratio for deformation and expressed as deformation per unit length
<b>Tension</b>	Force tending to lengthen a member in the direction of the applied load. The stressed area is perpendicular to direction of load
<b>Compression</b>	Force tending to compress a member in the direction of the applied load. The stressed area is, perpendicular to direction of load
<b>Shear</b>	Force tending to deform a member in the plane at right angles to main axis of member. Stressed area is parallel to direction of load
<b>Loadbearing</b>	Any part of a structure carrying a load other than that due to its own weight and to wind pressure on its own surface
<b>Tie or tendon</b>	Member subjected to a tensile load. Dimensions of cross section are small in relation to length in the direction of loading and the member can be flexible
<b>Strut</b>	Member subjected to a compressive load. In general, dimensions of cross section are smaller than length in direction of loading
<b>Beam</b>	Member subjected to bending. Dimensions of cross section are smaller than length. The load acts, in general, perpendicular to longitudinal or main axis of member
<b>Column</b>	Strut which may be subjected to bending
<b>Slab</b>	Member, of much greater width than depth, which is subjected to bending. The load acts perpendicularly to plane of surface of slab
<b>Panel (structural)</b>	Slab in which the load acts on one edge in the direction parallel to plane of surface of slab A beam can be considered to be a structural panel if its depth exceeds one-fifth of the span
<b>Frame</b>	Any combination of structural elements producing a skeleton construction in two or three dimensions
<b>Arch</b>	Curved structure which supports a loading system by the external end thrusts or internal end ties which sustain it
<b>Gatenary</b>	Curve formed by a flexible tendon under its own weight when hanging freely from end supports
<b>Surface structure</b>	Frameless structure deriving strength and rigidity from shape and in which stressing due to load must be considered two directionally. Shells are surface structures, and structural slabs and panels may be elements of surface structures



<b>Stressed skin structure</b>	Structure in which the cladding is stressed as a surface element but is integral with other structural elements which provide rigidity
<b>Suspension structure</b>	Two- and three-dimensional structures in which main elements are flexible ties generally in the form of catenaries. The suspension system is combined with rigid anchorages or a balancing system of compression members
<b>Prefabrication</b>	Construction of structural elements before erection in their final position
<b>Prestressed elements</b>	Structural elements in which effective internal stresses are induced artificially prior to application of working loads
<b>Pre-tensioning</b>	Method of prestressing in which tendons are tensioned before concrete is placed
<b>Post-tensioning</b>	Method of prestressing in which tendons are tensioned after concrete has hardened
<b>Elastic deformation</b>	Deformation under load in which strain is directly related to stress
<b>Plastic deformation</b>	Deformation under load in which strain is not directly related to stress
<b>Yield point</b>	Generally the stress at which elastic deformation ceases and plastic deformation begins
<b>Elastic design</b>	Design based on assumption of elastic behaviour
<b>Plastic theory</b>	Interpretation of the behaviour of a structural member at failure due to plastic deformation
<b>Collapse method of design</b>	Application of the plastic theory to design of a structure in which development of plastic conditions in certain elements of the structure determines the load at which the structure will fail by collapsing. Full strength of all members is fully exploited before failure
<b>Factor of safety</b>	Ratio between stress at failure and stress under working load and generally used in connection with elastic design
<b>Load factor</b>	Ratio between failure load of a structure or structural element as deduced by plastic theory and working load



**In relation to Concrete Structures****Truscon Limited**

supplies, as alternatives, the following services:

- (A) Structural design including the provision of all working drawings and schedules together with the supply of the necessary reinforcement delivered to site, cut, bent and labelled, ready for fixing by the contractor.
- (B) As for (A) plus complete construction work on site, either as nominated sub-contractor or by direct contract.

The range of sub- and super-structures completed and offered under both types of service is comprehensive, covering almost every imaginable type of building. Currently the Company is concerned with structures exceeding 30 storeys.

The structural solution recommended may be insitu or precast concrete, or a combination of the two. If precast elements are included, they may be provided from one of the Company's four factories or by means of site precasting, the proportion being determined to provide the most favourable balance of work on site. Similarly reinforcement may be mild or high tensile steel, or may be provided by pre-tensioning or post-tensioning of high tensile wire. Any combination of these alternatives may be used, the overriding consideration being to produce the most economical structure for a given purpose on a given site.

## STRUCTURES IN CONCRETE

The Company is not irretrievably wedded to precast to the exclusion of insitu, nor does the reverse apply. Under present conditions it is recognised that for many structures there is no balance of economy in favour of one or the other. In certain cases, however, either may show a marked economy.

The Company was responsible for the introduction into this country of the "Plate" system (flat plate, no beams) and this form of largely insitu structure, or one of its derivatives, frequently provides a most economical structure. A largely precast system, entitled "Picture Frame", is also available. Combining structural framing elements with a precast—prestressed floor, it often shows marked advantages—in cases where a *high measure of standardisation* is acceptable.

The Company has over 50 years' experience in the field of concrete engineering and employs a large number of qualified engineers in its various offices. Its Construction Department is fully equipped with staff and plant, including over 30 modern tower cranes, to handle contracts of the largest size anywhere in the United Kingdom.

For serious projects Truscon will prepare schemes with quotations, or approximate prices, free of charge and without obligation. The earliest consultation to provide a real measure of architect/engineer co-operation is welcomed and, while not indispensable, is considered essential if the fullest structural economies are to be obtained. To this end a Site Investigation Service is also available.

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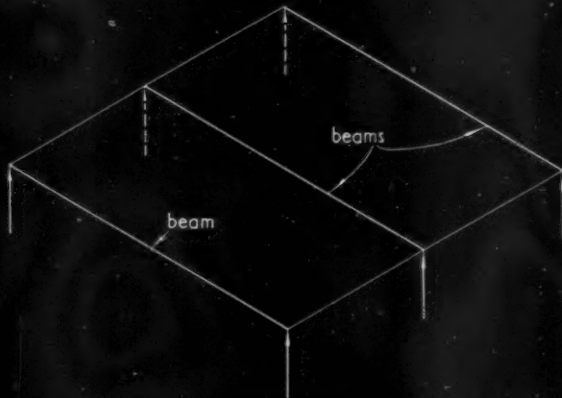
Please address enquiries to:

## Truscon Limited

35-41 Lower Marsh, London SE.1. Waterloo 6922

Also at: BIRMINGHAM: (Edgbaston), George House, George Road, Birmingham 15. Edgbaston 4391-2-3 BRISTOL: Royal London Buildings, Baldwin Street, Bristol 1. Bristol 21861 GLASGOW: 10 India Street, Glasgow C.2. Central 0157-8 LIVERPOOL: 3 Tithebarn Street, Liverpool 2. Central 5281-2 MANCHESTER: 50 Seymour Grove, Old Trafford, Manchester 16. Trafford Park 2766 YORK: 56 Shipton Road, York. York 24594





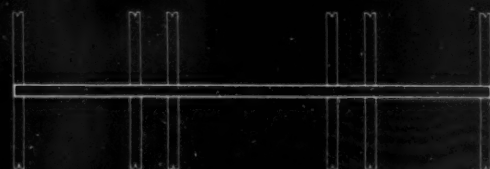
BEAM AND SLAB CONSTRUCTION.



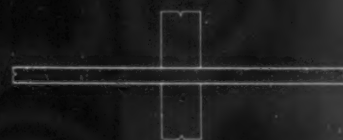
FLAT SLAB CONSTRUCTION.



plan



section  
FLAT SLAB : SOLID FLOOR.



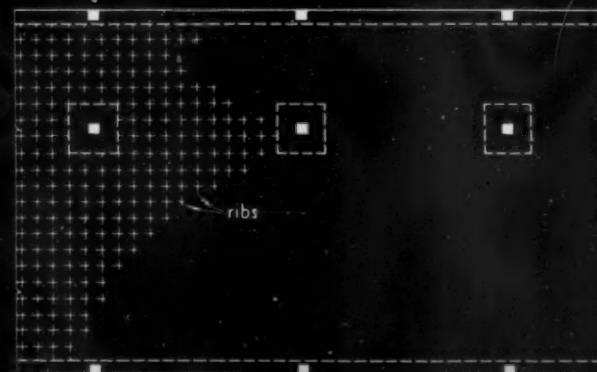
basic form



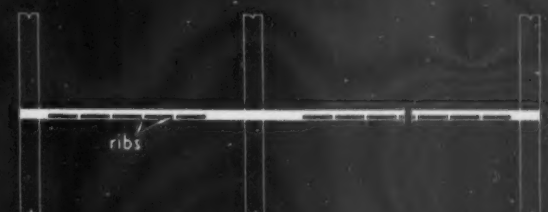
dropped (or raised) panel



column cap  
COLUMN TO FLOOR JUNCTIONS



FLAT SLAB : RIBBED FLOOR



section



## SURFACE STRUCTURES 1: FLAT SLAB CONSTRUCTION

This Sheet is one of a series on the forms of surface structures as distinct from skeleton structures. It describes the principles of flat slab construction and the general advantages obtained from this form of construction.

### Definition

CP 114: 1957, *The Structural Use of Reinforced Concrete in Buildings*, describes flat slab construction as "... a reinforced concrete slab with or without drops, supported, generally without beams, by columns with or without flared column heads".

### Structural form

True flat slab, in its simplest form, is illustrated on the face of this Sheet in the first of the three section drawings at the top. Alternative forms are the dropped (or raised) panel, illustrated in the second section and the column cap, illustrated in the third.

The floor slabs in flat slab construction need not be solid. Recesses may be formed on the soffit to reduce the amount of concrete. One technique is to form ribs in two directions as illustrated in the second diagram on the face. This is done by placing glass fibre moulds, woodwool or timber boxes in the formwork.

### Basic advantages of flat slab

True flat slab construction has certain advantages over beam and slab construction:

1. It is the simplest possible structure comprising only columns and slabs. Formwork is simplified resulting in speedier and more economical construction.

2. Columns need not follow grid lines. In beam and slab construction the positions of columns are dictated by the beam layout. As there are no beams in flat slab the columns may be positioned to suit the planning requirements.

3. There are no projecting beams, hence storey heights are reduced to a minimum.

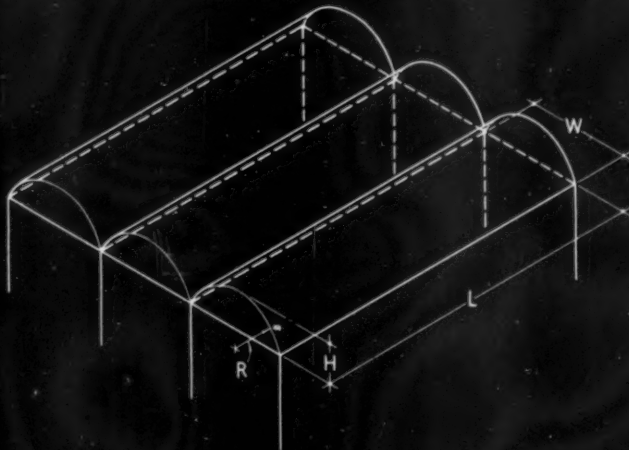
4. The flat soffit simplifies service runs and the positioning of partitions and lighting.

A flat soffit can also be achieved in beam and slab construction with the use of precast concrete ribs and precast concrete or clay hollow pot in-fill tiles. This subject is dealt with in SfB (23) Floors: Suspended and the Information Sheets contain a survey of proprietary systems.

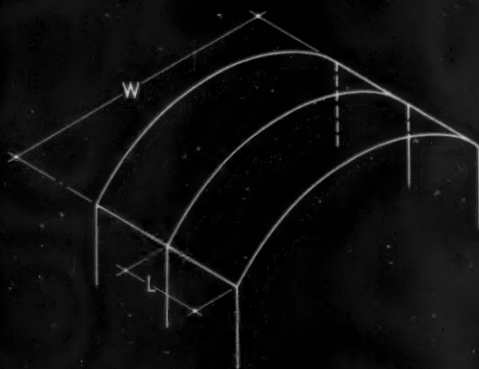
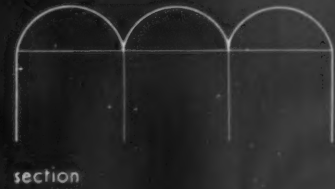
### Design requirements

The structural design of tall flat slab structures will normally be in the hands of the consultant engineer. In principle, structures of this type are designed to resist lateral forces as normal framed structures by a combination of lift walls and columns acting monolithically with the floors, and designed as a series of frames. The design of the column-to-floor connection is critical and certain restrictions must be imposed on the size and location of service holes near columns.

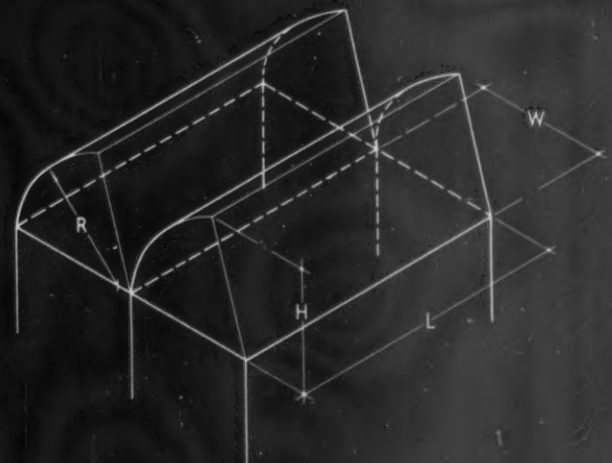




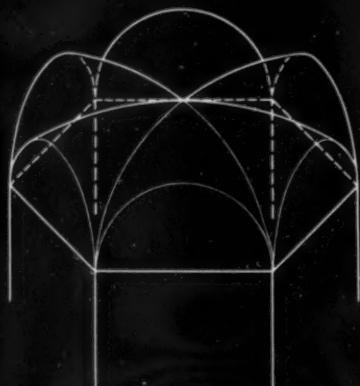
TRANSVERSE SHELL



LONGITUDINAL SHELL ON PORTAL FRAME



NORTHLIGHT SHELL



INTERSECTING BARREL SHELLS



CONOIDAL SHELL



## SURFACE STRUCTURES 2: SINGLE-CURVATURE STRUCTURES

This Sheet is one of a series on types of surface structure. It describes a number of single-curvature structures. The drawings on the face of the Sheet illustrate some of the basic forms of this type of structure.

## Definitions

A surface structure is frameless, deriving strength and rigidity from its shape and elastic behaviour.

Single-curvature structures may be defined as having the centres of curvature of all sections on the same side of the surface, except for one section which is a straight line.

## Types of Single-Curvature Structure

*Barrel shell* is a single-curvature structure supported between end stiffening beams with or without edge beams.

*Transverse shell* is a form of barrel shell in which the span L is longer than the width W.

*Longitudinal shell* is a form of barrel shell in which the span L is less than the width W.

*Northlight shell* is a single-curvature structure in which the shell, in effect, is inclined. Normally the span L is greater than the width W. This type of shell is generally used in series, as illustrated in the diagram on the face.

*Intersecting barrel shells* are, as their name implies, two or more shells intersecting at a point.

*Conoidal shell* is a single curvature structure formed by a straight line gliding between two guiding lines one of which is curved and the other straight.

## Economical Dimensional Range

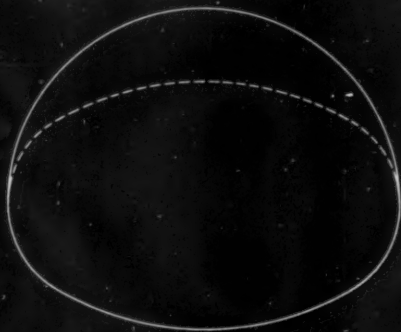
The table lists the economical range of dimensions for a

number of the single-curvature structures illustrated. It should be read in conjunction with the drawings on the face.

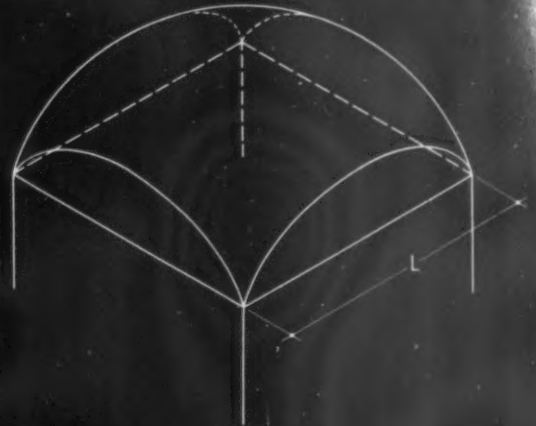
Structure	span L (ft in)	width W (ft in)	radius of curve R (ft in)	height of end stiffener H (ft in)
transverse shell	100 0	50 0	35 0	10 6
	80 0	40 0	35 0	6 3
	60 0	30 0	30 0	4 6
longitudinal shell on portal frame	up to 150 0	15 0 to 20 0	—	—
northlight shell	60 0	40 0	40 0	16 0
	50 0	33 0	40 0	14 0
	40 0	27 0	35 0	12 0
	30 0	20 0	30 0	10 0
conoidal shell	25 0	60 0	—	—
	35 0	80 0*	—	—
longitudinal shell	100 0 to 300 0	15 0 to 30 0	—	—

\* Widths up to 200 ft are possible with composite steel and concrete structures.

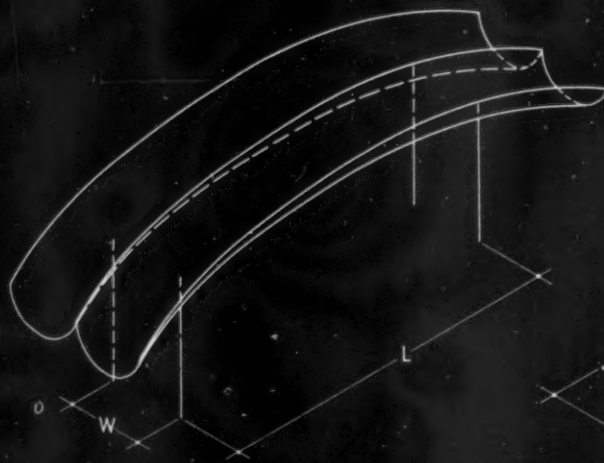




ROTATIONAL SHELL



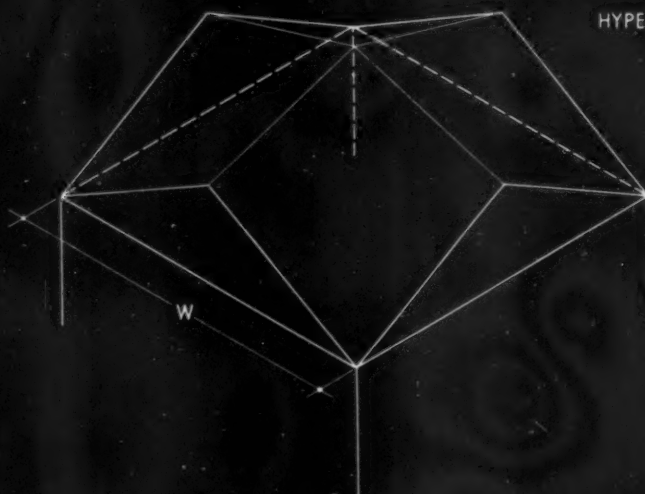
TRANSITIONAL SHELL : TYPE A



TRANSITIONAL SHELL : TYPE B



HYPERBOLIC PARABOLOID : TYPE A



HYPERBOLIC PARABOLOID : TYPE B



### SURFACE STRUCTURES 3: DOUBLE-CURVATURE STRUCTURES

This Sheet is one of a series on types of surface structure. It describes a number of double-curvature structures. The drawings on the face of the Sheet illustrate some of the basic forms of this type of structure.

#### Definitions

A surface structure is frameless, deriving strength and rigidity from its shape and elastic behaviour.

Double-curvature structures may be defined as those in which the principal normal sections are curves.

#### Types of Double-Curvature Structure

*Rotational shell* is a double-curvature structure formed by a curved line rotating about a central axis.

*Transitional shell* is a double-curvature structure formed by one curved line moving along another curved line which may or may not be of a similar geometrical pattern.

*Hyperbolic paraboloid* is a double-curvature structure whose surface is generated by a straight line gliding between two guiding lines, both of which are straight and parallel on plan and inclined towards each other.

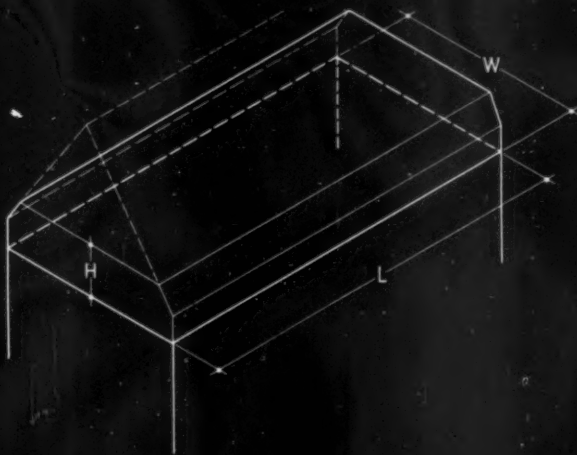
#### Economical Dimensional Range

The table lists the economical range of dimensions for the double-curvature structures illustrated. It should be read in conjunction with the drawings on the face.

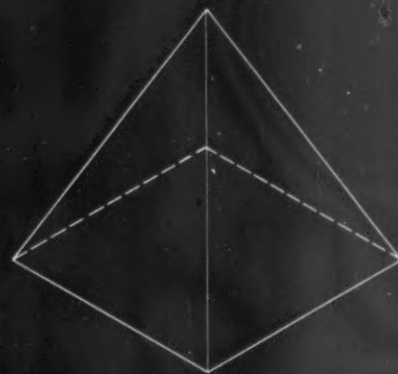
Structure	span L (ft)	width W (ft)
transitional shell type A	60 to 180*	—
transitional shell type B	60 to 120	10 to 20
hyperbolic paraboloid type A	—	30 to 60*
hyperbolic paraboloid type B	40 to 80	—

\* May be rectangular on plan

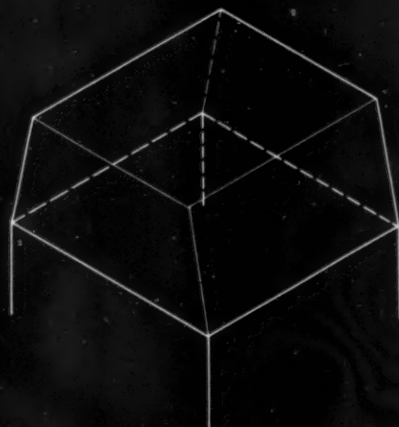




PRISMATIC.



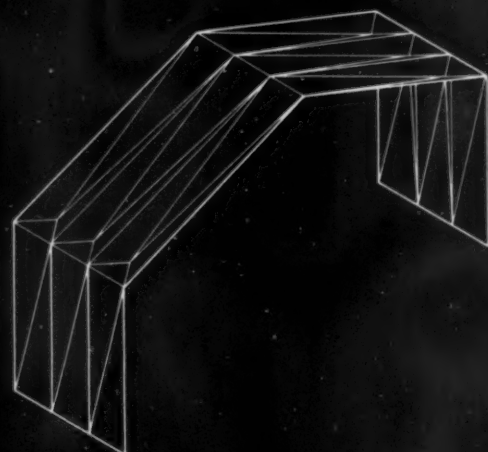
PYRAMIDAL



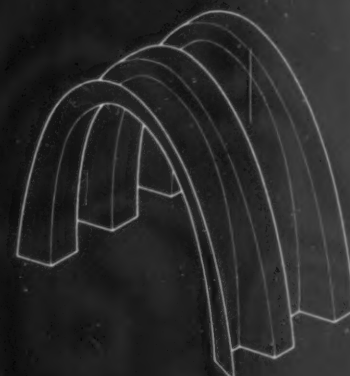
SEMI-PRISMATIC.



CONICAL FOLDS



FOLDED FRAME



FOLDED ARCH



## SURFACE STRUCTURES 4: FOLDED STRUCTURES

**This Sheet** is one of a series on types of surface structure, and deals with a number of folded structures.

### Definitions

A surface structure is frameless, deriving strength and rigidity from its shape and elastic behaviour.

Folded structures are made up of a series of inclined surfaces—triangular, rectangular or trapezoidal—which are subject to bending and direct forces, and which, acting together, produce a rigid structure.

### Types of Folded Structure

The drawings on the face of this Sheet illustrate the following types of folded structure:

- prismatic
- pyramidal
- semi-prismatic

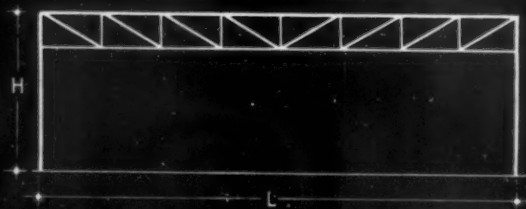
- conical folds
- folded frame
- folded arch

### Economical Dimensional Range

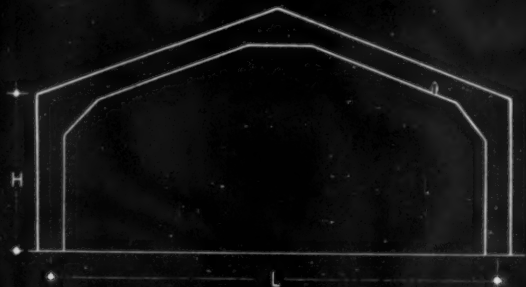
The table lists the economical range of dimensions for semi-prismatic structures.

span L (ft)	width W (ft)	height of end stiffener H (ft)
40	20	4
60	30	6
80	40	8





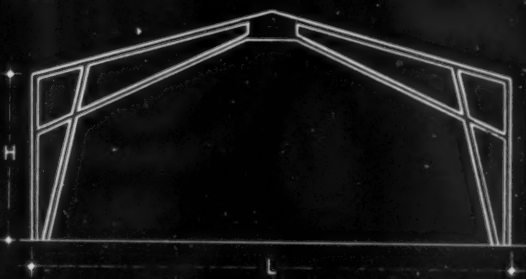
welded rolled steel lattice



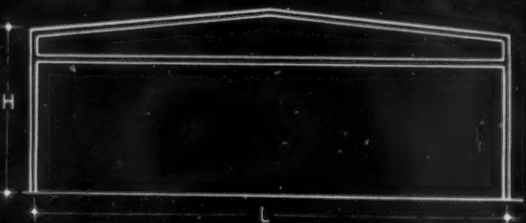
welded rolled steel solid-web portal frame



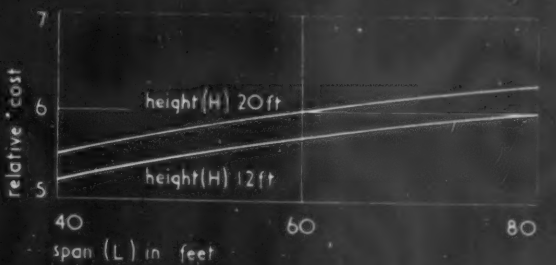
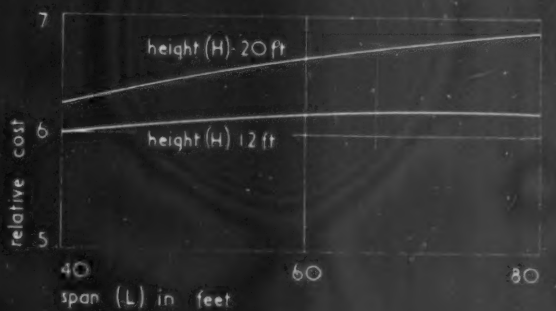
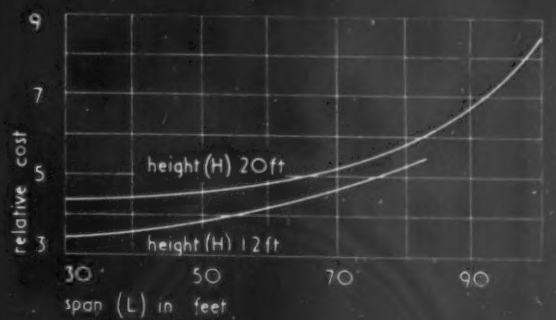
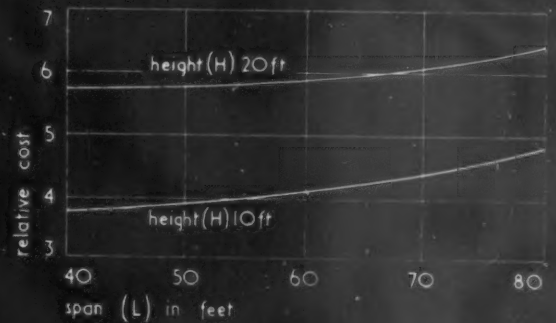
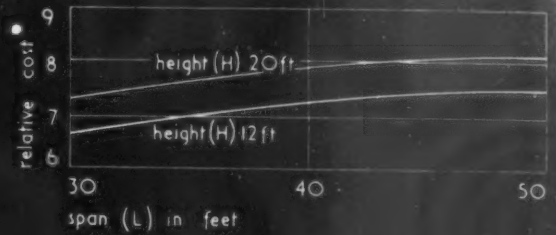
precast reinforced concrete portal frame



glued, laminated and nailed timber portal frame



glued, laminated and nailed timber ridge beam



• per unit area of floor in shillings



## SINGLE-STOREY FRAMED STRUCTURES

This Sheet provides relative cost data for a number of structural framing systems for single-storey buildings in steel, reinforced concrete and timber. It is intended as a preliminary guide to the choice of structural system and material. The Sheet is based on Factory Building Studies 7, *Structural Frameworks for Single-Storey Factory Buildings*, by H. V. Apcar. The diagrams and graphs are reproduced by permission of the Controller of HM Stationery Office. Whilst this publication, as its name implies, relates to structures for factory buildings, the diagrams of structural types illustrated on the Sheet are those which are not specific to factory construction and are, in fact, applicable to many building types requiring single-storey structures and large areas of unobstructed floor space.

### Cost Data

The vertical scales on the graphs refer to relative figures of cost and are intended as a basis for comparison between the several types of structure illustrated. As a guide to the actual costs current on May 1 1959, but subject to the variability which must be expected in any work in which a competitive element is present, the relative cost numbers may be read as shillings per square foot of floor area.

The data were originally supplied by commercial firms, whose names appear below, and are typical of their own quotations for their particular forms of construction. Unless indicated otherwise the data include for the complete structural framing (ready for sheet cladding weighing approximately 6-7 lb/sq ft) supplied, delivered and erected on prepared foundations within the outer London area. The data are based on an assumed building about 250 ft by 200 ft on plan.

### Manufacturers:

The Arcon Group, 41 Welbeck Street, London w1  
Beves and Co (Structures) Ltd, Kingston Wharf, Shoreham-by-Sea, Sussex  
Concrete Ltd, Green Lane, Hounslow, Middlesex  
Conder Engineering Co Ltd, Winchester, Hants  
Coseley Buildings Ltd, Lanesfield, Wolverhampton  
R. E. Eagan Ltd, 167 Victoria Street, London sw1  
GKN Reinforcements Ltd, 197 Knightsbridge, Kensington, London sw7  
Hotchkiss Engineers Ltd, 33 Terminus Place, Eastbourne, Sussex  
Sherbourne Engineering Ltd, Sherbourne Road, Acocks Green, Birmingham 27

### Structural Design

The relative costs are generally based on designs conforming to the relevant BS Codes of Practice, to the loading requirements of BS CP3 Chapter v: 1952 *Loading*, for an imposed load of 15 lb/sq ft, and to a wind pressure corresponding to a wind velocity of about 70 mph.

### Structural Systems

The following notes should be read in conjunction with the drawings on the face of the Sheet.

*Welded rolled steel lattice:* Rolled steel angle and steel tube are employed in the framing of the lattice members and joist sections as stanchions.

*Welded rolled steel solid-web portal frame:* Rolled steel joists are fabricated to form low-pitched portal frames spaced at 15-ft centres. Column and rafter members are fabricated as separate units, which are bolted together on site; the rafters have stiffened splayed webs at ridge and eaves to accommodate the increased bending at these points.

*Precast reinforced concrete portal frame:* This consists of precast members connected on site by bolted scarf-type joints located more or less at the points of contraflexure; thus the frame has all the advantages of structural continuity, added to those of ease and speed of erection. Precast angle-section purlins and channel-section valley gutters are included in the cost figures; sheeting rails have not been included, because the outer walling is usually of brickwork or blockwork infilling between frames.

*Glued, laminated and nailed timber portal frame:* This is usually of the three-pin arch type, ie having a "pin" connection at the ridge and at each of the column feet, with each column and its rafter fabricated as a continuous unit; when necessary, however, the ridge pin can be converted with deep side plates and through bolts into a rigid connection which adds to the stiffness of the frame. Depending on span and functional requirements, this type can be constructed in either glued laminated, solid-section members or a patented form of joist section having laminated flanges pattern-nailed to two-ply webs.

*Glued, laminated and nailed timber ridged beam:* This can be either a flat roof or a low pitch and uses beam members as for the portal type supported on built-up columns cantilevered from the foundations.



# ALL STRUCTURAL TIMBER NEEDS

Untreated timber may be subject to decay under damp conditions and insect damage under any conditions. 'Tanalith' or 'Pyrolith' treatments protect it from both hazards.

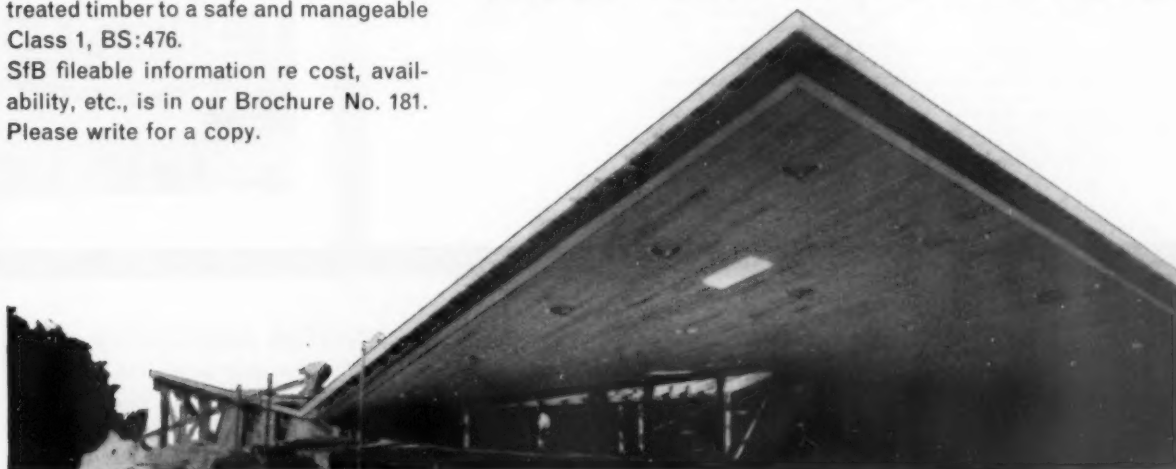
'Tanalith' is fully fixed and can be used in situations which are intermittently or continuously wet.

'Pyrolith' treatment reduces the rapid spread of flame associated with untreated timber to a safe and manageable Class 1, BS:476.

SfB fileable information re cost, availability, etc., is in our Brochure No. 181. Please write for a copy.

**'Tanalith'** *preservative*  
**OR**

**'Pyrolith'** *flame retardant*  
**IMPREGNATION**



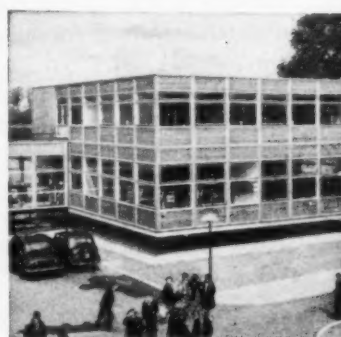
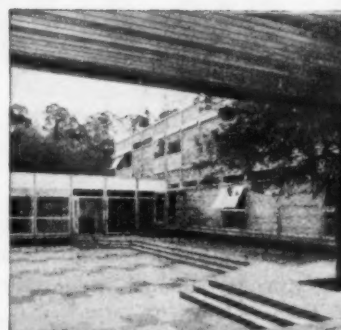
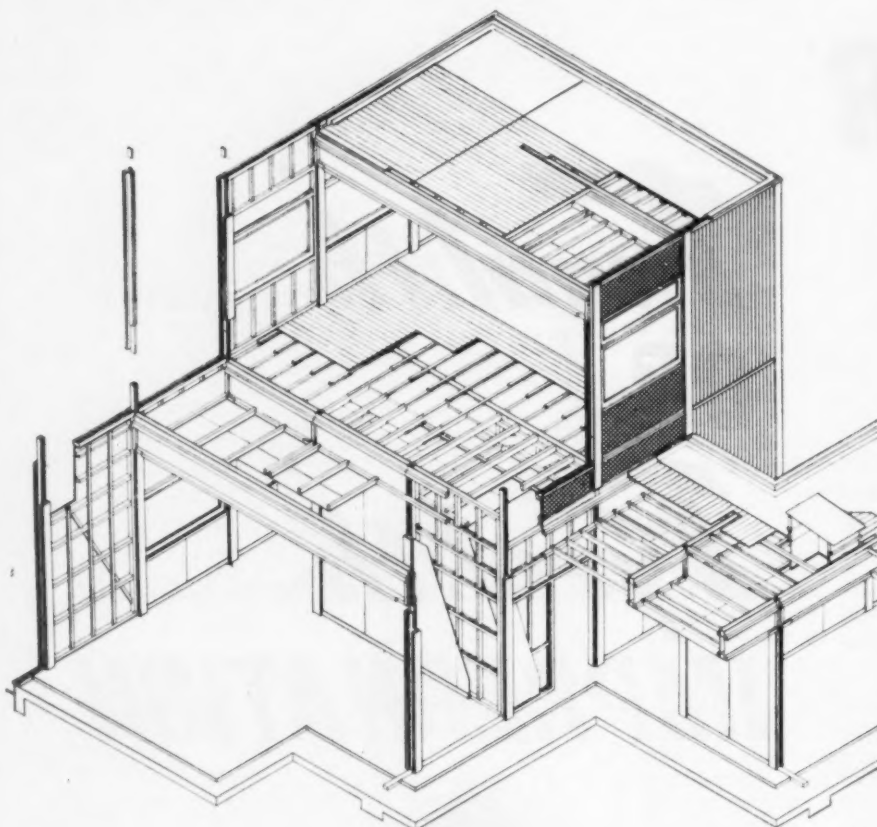
**HICKSON'S TIMBER IMPREGNATION CO. (G.B.) LTD.**

Castleford, Yorkshire. Castleford 3841

8 Buckingham Palace Gardens, London S.W.1. SLOane 0636



# MEDWAY MK5 SYSTEM



# MEDWAY MK4 SYSTEM

Structural centre line planning grid 6' 0". Clear spans of 8° double pitched roof—12' 0", 18' 0", 24' 0" and 30' 0". Clear spans of flat roof 6' 0", 12' 0" and 18' 0". Multiple spans permissible. The system can be used for layouts with "T" and "L" junctions, varying spans and combined flat and pitched roofs. Two eaves heights 8' 6" and 11' 10". Two alternative eaves and verge overhangs 6" or 18". All wall panels interchangeable (no special corner panels). Clerestory lighting possible between two heights. Cladding vertical moulded cedar or waterproof plywood can be mixed, e.g., painted plywood window panels on one elevation—remainder natural cedar. Internally, various sheet materials can be used for the walls and partitions and for the ceiling which can be flat or can follow the line of the roof. A timber floor can be included or the building can be constructed on a concrete slab. In addition to the basic permanent system, there is a transportable version designed for easy moving and re-erection.



## General

### 1 Scope of system

- The system comprises:
- a structural frame consisting of timber columns and constant depth beams capable of being assembled into single storey or two storey buildings;
  - external wall and window panels and internal wall and glazed panels, all of timber construction, which complete the structural frame and provide wind bracing;
  - a flat roof of timber joists and boarding;
  - a first floor of timber joists and boarding floating on polystyrene foam pads with gypsum wool loose fill;
  - internal finishes to external and internal walls of  $\frac{1}{2}$ " plasterboard, the plasterboard lining to the external walls backed with polished aluminium foil (other finishes are available);
  - flat ceilings suspended below beams at constant level; the ceiling provides fire protection to the structure where needed.

**2 Grid** The structural grid is 6' 4". The system can be developed in two directions on this dimension, and openings at change of direction of structure are possible to a limited degree by the use of trimmer beams. Spans range from 6' 4" to 25' 4" for floors and 6' 4" to 44' 4" for roofs.

**3 Room Height** Four heights of rooms are provided: 8' 3", 9' 9", 12' 9" and 15' 9" (nominal).

**4 Structural Design** The structure conforms with the requirements of the British Standards Code of Practice C.P.112 (1952): 'The Structural Use of Timber in Buildings', and C.P.3 Chapter V: 'Code of Functional Requirements in Building (Loading)', and with the requirements of the Ministry of Education Building Bulletin No. 7: 'Fire and the Design of Schools'.

## Materials

### 1 Timber

External sole plate  
Internal sole plate  
External cladding  
Structural components

Afrormosia  
Tanalised Softwood  
Western Red Cedar

### Joinery

Note: All timber will be wet and the dimensions specified are nominal sizes before machining.

Canadian Douglas Fir and Baltic Softwood to British Standards Code of Practice C.P.112 (1952). Baltic Softwood or Canadian Softwood, u/s grade or equivalent to B.S.1186, Part 1.

### 2 Plywood

External Grade

Phenolic resin bonded in accordance with British Standards Specification 1455, classification AX.100.—W.B.P.

### 3 Finished Hardware

Polished anodised aluminium, as detailed in the particular specification.

## Construction

**1 Perimeter Sole Plate** Afrormosia 5" x 2" grooved to receive hardwood locating strip.

**2 External Walls** Timber framed panels of various heights according to the required ceiling height, bolted to structural columns set at 6' 4" centres. All panels incorporate a cedar top cill member which either provides the seating for the upper panels when used in two-storey construction, or forms the coping at roof level where it is finished with an aluminium trim.

Two types of contrasting panels are used: 'Solid Wall' panels and 'Window' panels:

Solid wall panels have 3" x 2" framing studs,  $4\frac{1}{2}$ " x 3" top cill, 3" x 2" floor cill and rails, with intermediate studs and braces, and are clad with 1" western red cedar boarding laid vertically, secret nailed, and backed by bitumen impregnated building paper.

Window panels have 3" x 3" framing studs,  $4\frac{1}{2}$ " x 3" top cill, 4" x 3" window cills and transoms, 3" x 2½" floor cill, with intermediate studs. Cladding can be from a variety of sheet materials or can be 1" western red cedar boarding laid vertically, secret nailed with a narrow moulded joint and backed with bitumen impregnated building paper. Cill heights are 1' 6" or 3' 0". Lights are fixed below cill, fixed or projected sashes between transom and cill, fixed or top hung sashes above transom. Sashes are from 3" x 2", with 4" x 2" bottom rail on projected sashes.

Door panels and clerestory panels of similar construction are available to match both main ranges of external panels.

Vertical tile hanging may be used as a cladding material in some areas.

All panels are interchangeable in any position on ground floor or first floor. Linings are ½" aluminium foil backed plasterboard.

**3 Internal Walls** Timber framed panels bolted to structural columns in a similar manner to external walls and carried on a tanalised sole plate. Various heights are provided to accommodate the different ceiling heights on ground floor or first floor. Partitions can finish beneath beams or be carried to underside of first floor or roof with the beam omitted. Construction is 3" x 2" framing with 3" x 1½" intermediate studs and 2" x ½" lining battens.

Internal partitions may be fully lined with ½" plasterboard (or other sheet material) or may incorporate a variety of glazed panels, single or double doors, etc.

**4 Columns** These are of □ section of which the outer member is in western red cedar to match the cladding. The inner member varies in thickness to suit the loads to be carried. The columns are stiffened by the side members of the wall or window panels. All columns and jambs of window panels on ground floors in two-storey buildings have ½" additional thickness of timber to that which is structurally necessary in order to give them a fire resistance of half an hour without the addition of fibrous plaster casings.

**5 Roof Construction** 20" deep plywood box beams are housed into columns at 6' 4" centres. Spans are 6' 4", 12' 8", 19' 0", 25' 4", 31' 8", 38' 0" and 44' 4"; the last two are slightly pitched and the remainder flat. 12' 8" trimmer beams may be used at change of direction of structure. Decking is ½" t & g boarding on 3" x 1½" purlins to carry three-layer roofing felt, the first layer bonded to the timber boarding in the factory, the remaining two layers on site with a finish of limestone or other approved mineral chipping. Fibreglass quilt is laid beneath deck to provide thermal insulation.

Roof lights 3' 0" x 3' 0" approximately — either opening or fixed type — can be included where required. Rainwater disposal is by internal aluminium downpipes from inlet sumps within roof thickness.

**6 First Floor Construction** 2' 0" deep plywood box beams are housed into columns at 6' 4" centres. Spans are 6' 4", 12' 8", 19' 0" and 25' 4". Trimmer beams 12' 8" long may be used at change of direction of structure. Deck is 1" t & g boarding in random lengths fixed on site to battens laid parallel to the 4" x 2" joists and floating on polystyrene pads to deaden vibration. Joists are plugged with gypsum loose fill at 3lb./ft.<sup>3</sup> to minimise airborne sound transmission. Floor covering (not by Medway) is assumed to be linoleum, rubber or other sheet material.

**7 Suspended Ceiling** The ceiling is suspended below the beams and provides a flat surface throughout. The ground floor ceiling of two-storey buildings is of ½" Asbestolux panels and provides half an hour fire protection to the structure. Single-storey and first floor ceilings will be 3" x 3" or 6" x 3" panels of ½" plasterboard. In both cases a percentage of panels can be perforated and backed with mineral fibre membrane to provide the required degree of acoustic correction. If required, beams can be left exposed in gymnasia with ceiling lining applied to the underside of purlins.

## CONTRACT NOTES

Close liaison between architect and manufacturer is very important right from the initial planning stage. Medway technicians are available for discussions on any preliminary sketch plan and this is strongly advised. It is usual for the Medway company to undertake the site erection of the structure including roof covering, glazing and linings. This ensures correct assembly and a well finished building. In such cases Medway normally act as a nominated sub-contractor to the general contractor. Whilst recommending the above procedure for most cases, it is acknowledged that there is the odd occasion where it is advantageous to supply the components for independent erection by others. Equally there are schemes where the Medway organisation are called upon to act as a general contractor embracing the whole of the building works and services. Any of these alternative methods is possible and it is suggested the contractual procedure should be agreed at the initial discussion of any project.

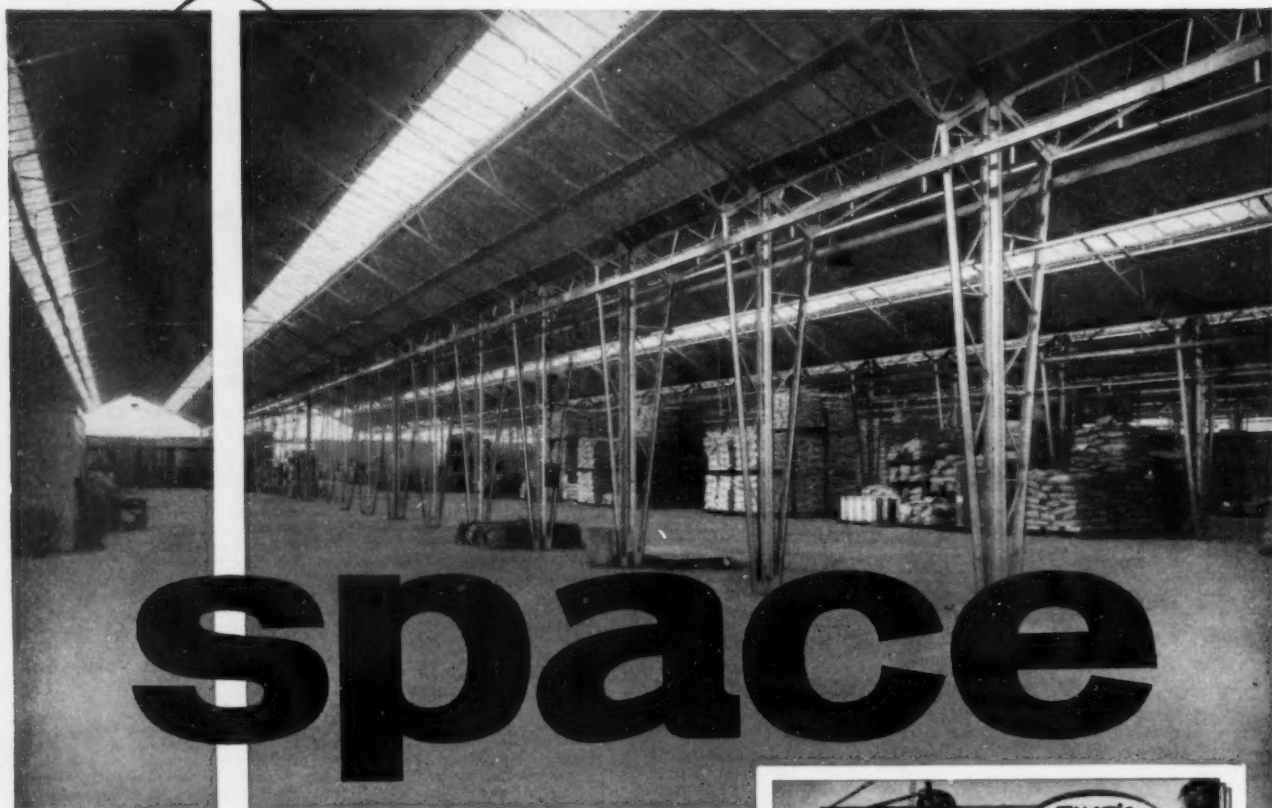
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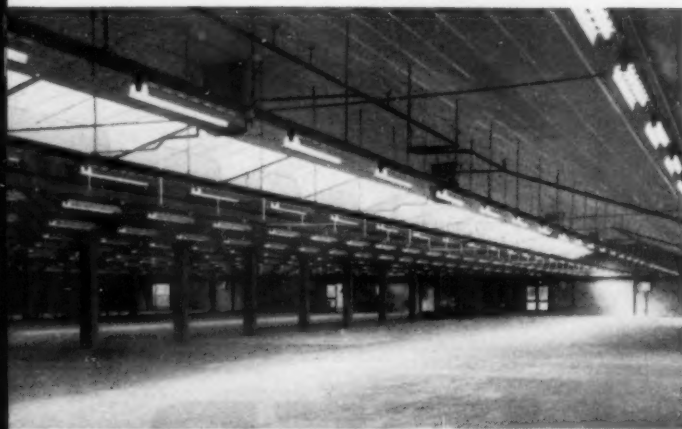


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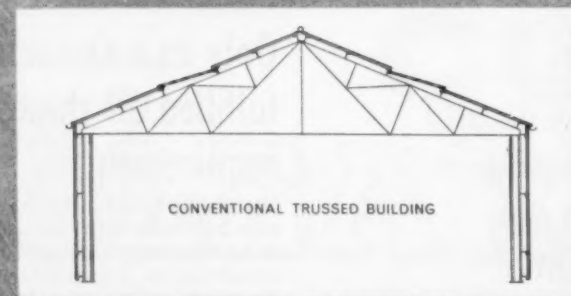
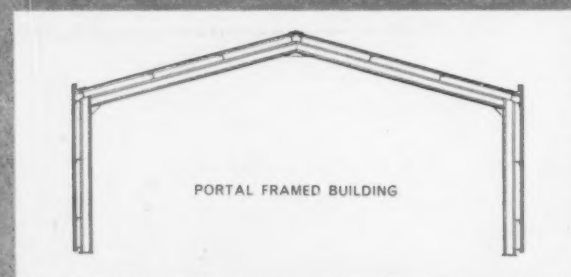
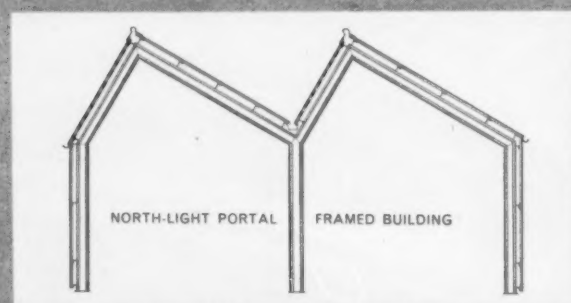
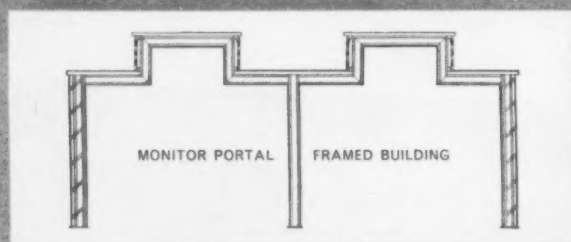
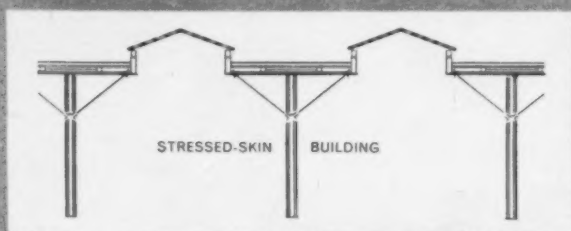
# STRUCTURAL STEELWORK

SfB (2)Hd2

UDC 624.94

SfB (2)Hd2

UDC 624.94



Buildings designed to B.S.449/1959 by semi-rigid and plastic design. Where advantageous, Universal Beams and Columns with high tensile steel and high strength friction-grip bolts adopted. Steelwork prepared, as required, for light-weight fire protection. Cladding materials also supplied as specified.

**JAMES AUSTIN & SONS (DEWSBURY) LIMITED.**

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Telephone: 1750 (5 lines) Telex 55-129  
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H.P. 8105



U.A.M. Group  
Information  
Service  
November 1961

# SEEL SPRAYED ASBESTOS DATA SHEET

Dh1

## SEEL SPRAYED ASBESTOS

### DESCRIPTION

Seel sprayed asbestos comprises selected and prepared asbestos fibres, applied with water and a suitable binder. It exceeds the requirements of B.S.1785. 1951.

### WEIGHT

The density of Seel is varied according to the purpose of the application. Normal weight is from 7 lb. to 9 lb. per cu. ft. The low density arises from the fibrous structure with enclosed air spaces.

### PROPERTIES











#### Sound Absorption

The sound absorption factor is 60 per cent at 500 c/s. The use of Seel in ducts and trunking is effective in preventing "drumming".

#### Thermal Conductivity

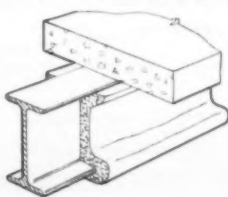
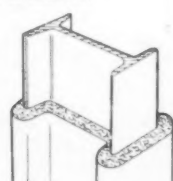
( $k$ ) = 0.32 B.th.U's/hr./sq. ft./in./ F.

The thermal efficiency of some typical industrial roofs lined with Seel is given in the table at right, where 'U' is the thermal transmittance in B.Th.U's/hr./sq. ft./°F.

				'U' Value
	Asbestos Cement 6" corrugations	Unlined SEEL Lining		1.4
				0.19
				0.17
				0.15
	Asbestos Cement 3" corrugations	Unlined SEEL Lining		1.4
				0.27
				0.23
				0.19
	Asbestos Cement Flat Sheetting	Unlined SEEL Lining		1.1
				0.4
				0.31
				0.25
	Corrugated Metal 3" Corrugations	Unlined SEEL Lining		1.5
				0.28
				0.23
				0.19
	Metal Sheetting	Unlined SEEL Lining		1.5
				0.25
				0.21
				0.18

### Fire

The materials used and the completed Seel coating are incombustible. There is no odour when exposed to heat or naked flame. For steel load-bearing columns the fire gradings according to B.S.476 are as follows:



Grade	Resistance Period - Hours	Thickness of SEEL - Inches
A	6	2 1/2
B	4	1 1/2
C	3	1 1/4
D	2	1 1/8
E	1	1 1/16

### Rot-proof

Rot and vermin-proof and will not support fungal growths.

### Application

Seel is applied by trained operators using special equipment. The spray method makes it simple to use, even in awkward positions. A Seel coating adheres strongly to any material and will not crack, flake, settle or otherwise be adversely affected by vibration. In most applications, no mechanical support or fixings are required.

### Maintenance

Once applied, Seel is permanent and there is no deterioration in its efficiency. Decoration is not necessary but the surface may be pressed, trowelled, decorated or otherwise provided with a special finish as required.

### Colour

Coloured textured finishes are available to any pastel shade.

### References

Report of special investigation on a standard fire resistance test on a structural steel beam protected with Seel sprayed asbestos by the Fire Research Station, Boreham Wood, Herts, F.R.O.S.I. No. 1735 December 1960.

Modern Fire Protection for structural steelwork by The British Constructional Steelwork Association. Fire Hazard Associated with the thermal insulation of buildings. Technical information Sheet 4002 by the Fire Protection Association.

## DESIGN AND SPECIFICATION

For thermal insulation, fire protection, anti-condensation, anti-corrosion, sound absorption, dust exclusion.

Seel sprayed asbestos can be used in many different positions and circumstances in new and existing buildings of all kinds. It is suitable for industrial roofs and walls, and for the ceilings and walls of commercial buildings, schools, lecture and concert halls, etc. It is used also on ducts and trunking for building services such as heating and ventilation.

Outside the building industry, its applications include plant, machinery, ships, road vehicles and railway rolling stock.

Chancery Insulations Ltd., 8 Upper Grosvenor Street, Grosvenor Square, London, W.1.  
Telephone: Grosvenor 5411.





# Brockhouse Steelwork

## BASIC DESIGN DATA

**GENERAL** A complete range of standard components for the construction of lightweight steel frames, fabricated from a combination of hot and cold-rolled sections. The system is in principle pin-jointed, rigidity being provided in the vertical plane by diagonal steel braces. The system also relies on the diaphragm effect of upper floors and roofs usually carried out in timber for stability. The components are designed so that the open web beams are of standard depth, and the stanchions of overall standard section. This allows repetitive detailing for such elements as external walls, roofs, internal partitions, etc.

**BASIC DIMENSIONS** Planning grid of 3ft. 4in. multiples in both directions; vertical intervals of 2ft. 0in. of multiples. Internal structural bays, 6ft. 8in. or 10ft. 0in. by from 6ft. 8in. to 26ft. 8in. (at 3ft. 4in. intervals). Also long span, pitched for single storey only, 6ft. 8in. or 10ft. 0in. by 40ft. 0in. or 46ft. 8in. flat and 40ft. 0in., 46ft. 8in. and 53ft. 4in. pitched.

Stanchions round perimeter of building at 6ft. 8in. or 10ft. 0in. intervals. Total structural depth of upper floors and roofs is always taken as 2ft. 0in. in multi-storey constructing.

**DESIGN LOADS** The system is designed for imposed loads of 15 lbs. per sq. ft. on roofs and 60 lbs. per sq. ft. on upper floors. The total design loads, including other structures, are 37 lbs. and 92 lbs. per sq. ft. respectively.

**FINISH** Components are protected against corrosion by phosphate dipping and stove enamelling in the factory.

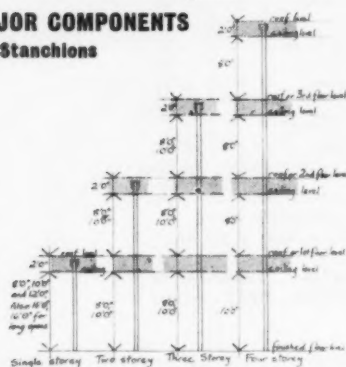
**TOLERANCES** Critical members are manufactured to approximately  $\frac{1}{16}$  in. tolerance.

**COST** The cost of the steelwork will, of course, vary depending upon the nature of the project. Cost analyses of completed buildings suggest, however, that the price per square foot of floor area will vary from about 7s. 0d. for simple single-storey buildings up to a maximum of about 10s. 0d. for complex multi-storey applications.

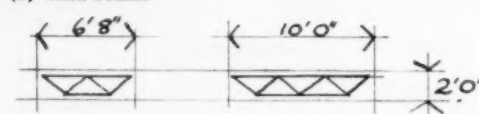
**SMALL COMPONENTS** A full range of minor components is available for the fixings required for external cladding, windows, upper floors, and roofs. Also available is a series of standard assemblies for staircases, and a range of standard stanchion base plates.

### MAJOR COMPONENTS

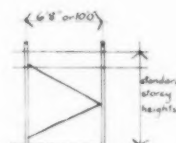
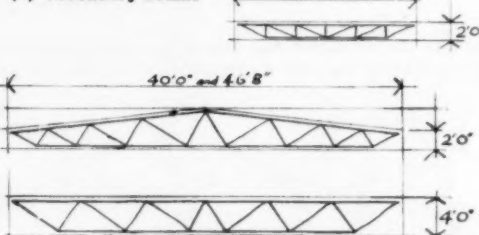
#### (a) Stanchions



#### (b) Main beams



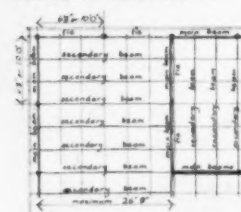
#### (c) Secondary beams



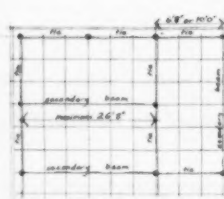
#### (d) Bracing

A complete range of bracing is available within structural bays as shown, between stanchions.

### TYPICAL ASSEMBLY

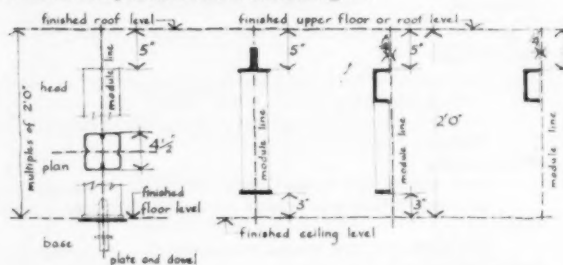


#### (a) Upper floors



#### (b) Roofs

### DETAILED RELATIONSHIP Of main components to dimensional grid.



#### (a) Stanchions

#### (b) Beams and perimeter ties

### DESIGN PROCEDURE

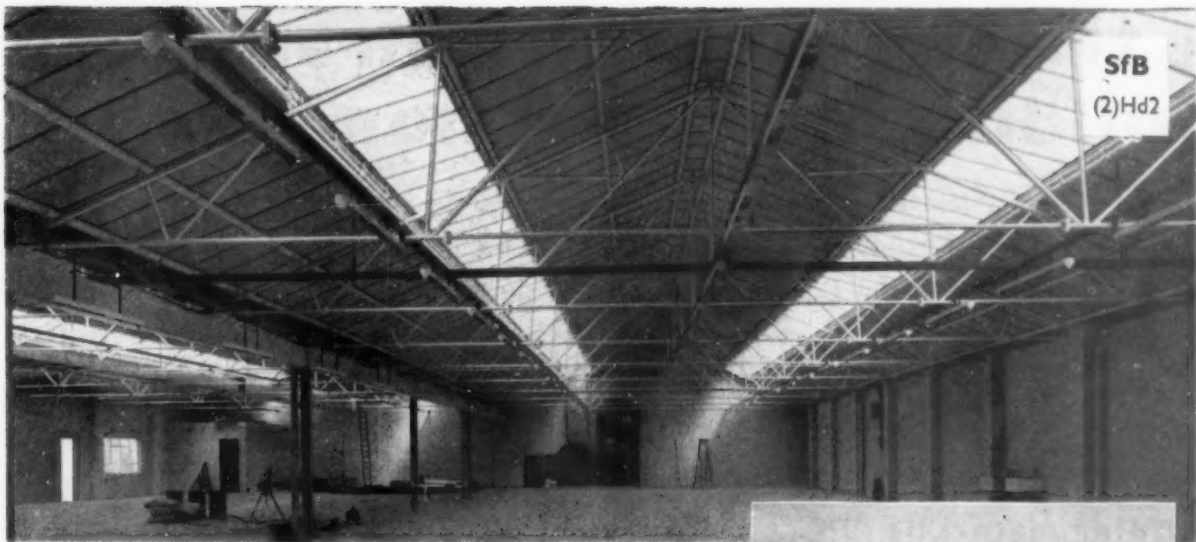
In any project using our components, please send for our comment as soon as they are available and before sketch design stage is completed, plans, sections and sketch layout of beams and stanchions.

- BIBLIOGRAPHY** MOE Building Bulletin No. 19: *The Story of CLASP*, HMSO price 5s. 0d. net.  
AJ October 10 and 27, 1957 (Technical description of CLASP).  
AJ April 30, 1959 (Buildings illustrated, three Nottinghamshire schools).  
AJ February 9, 1961 (Building study; Computer Building SfB (92): UDC 725.23).

For further information please write to:

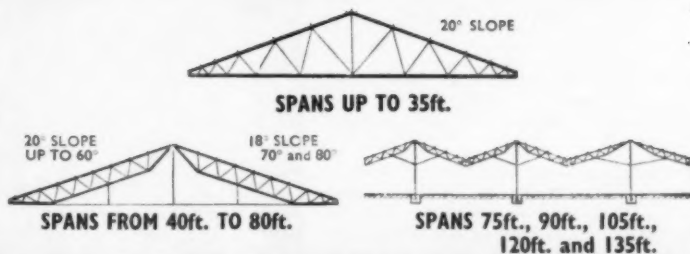
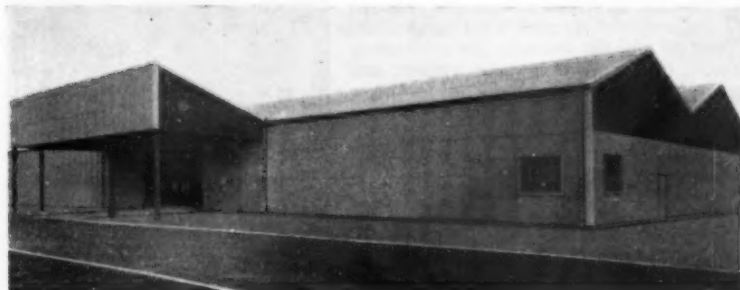
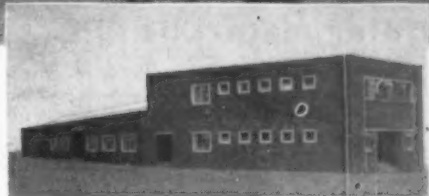
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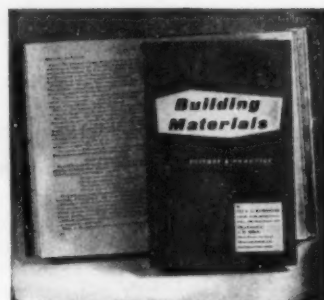
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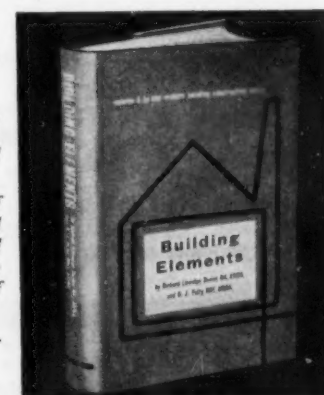


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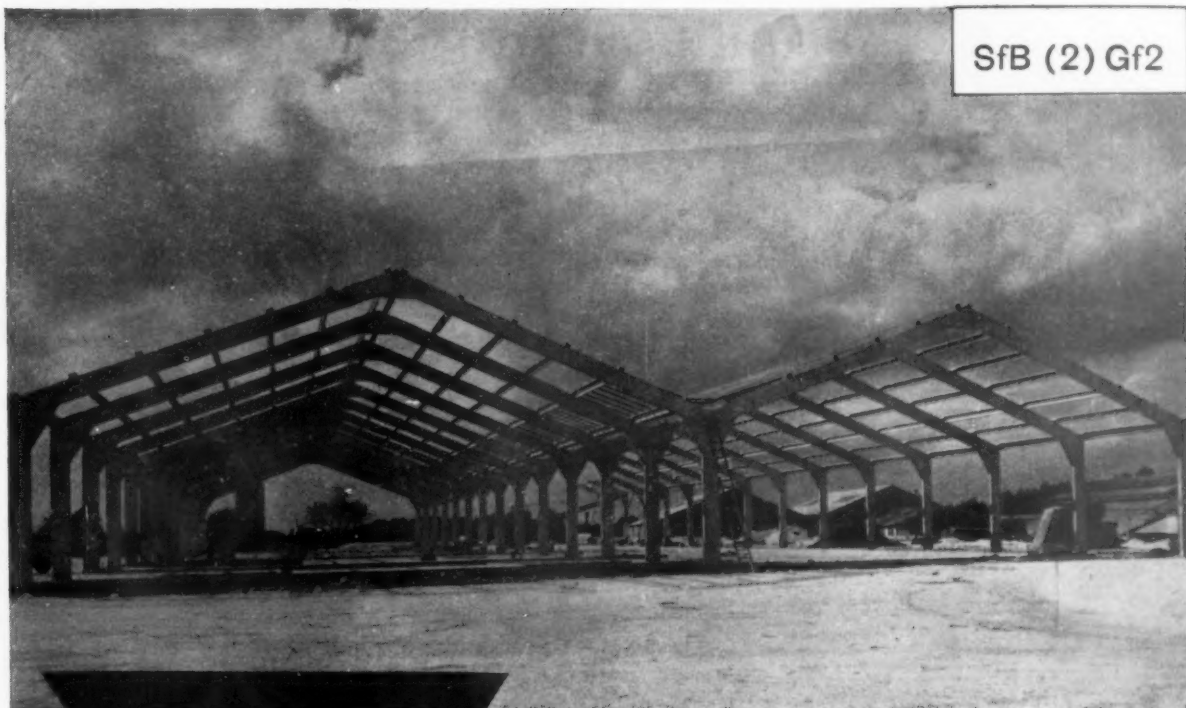


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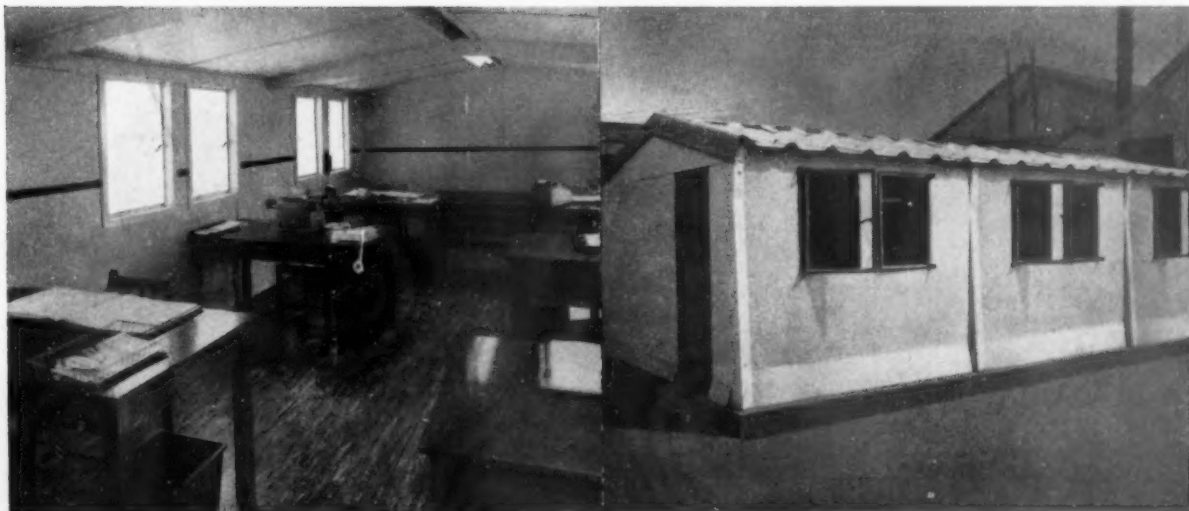
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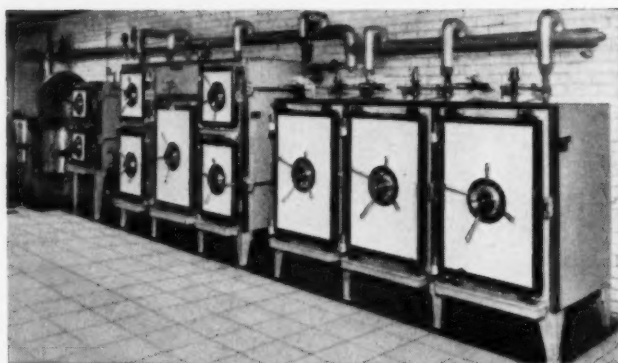




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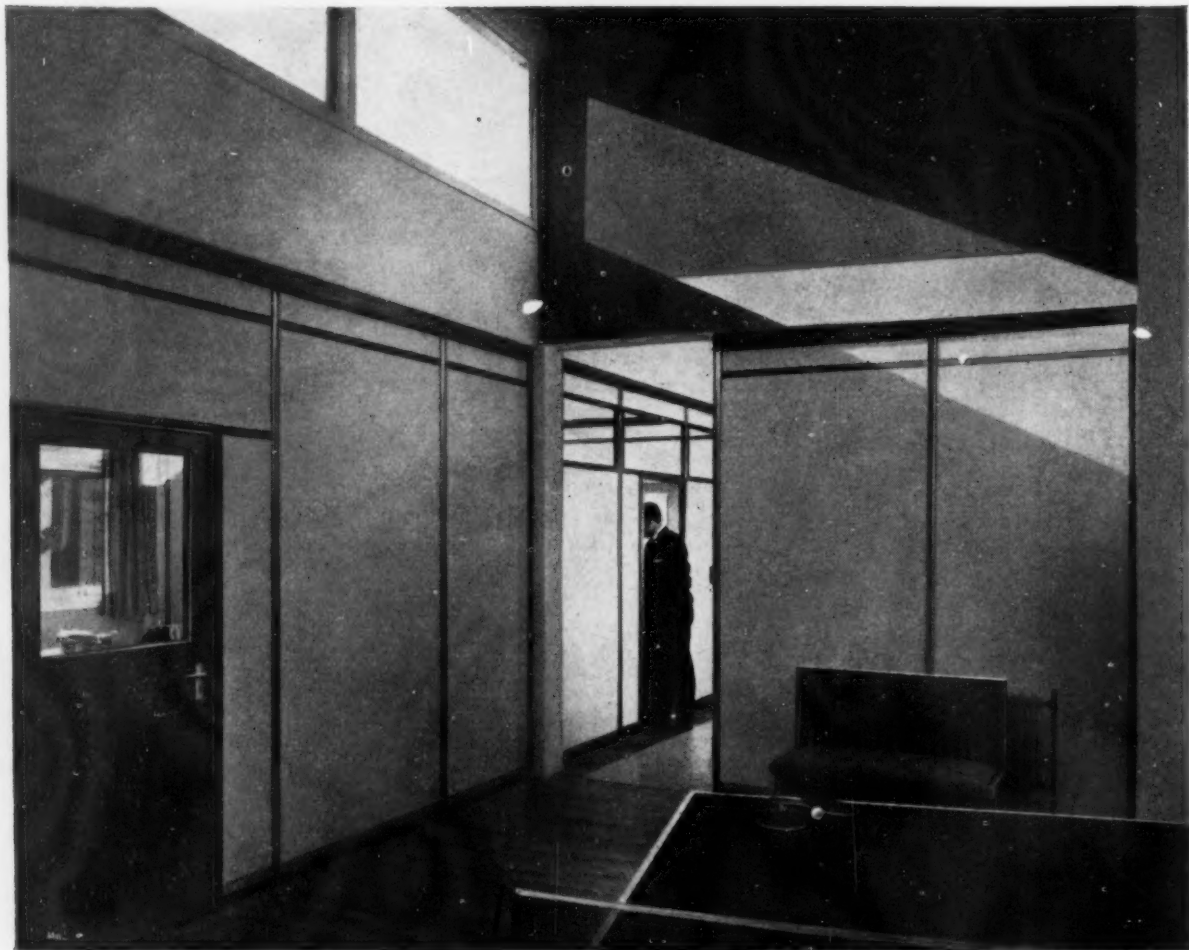
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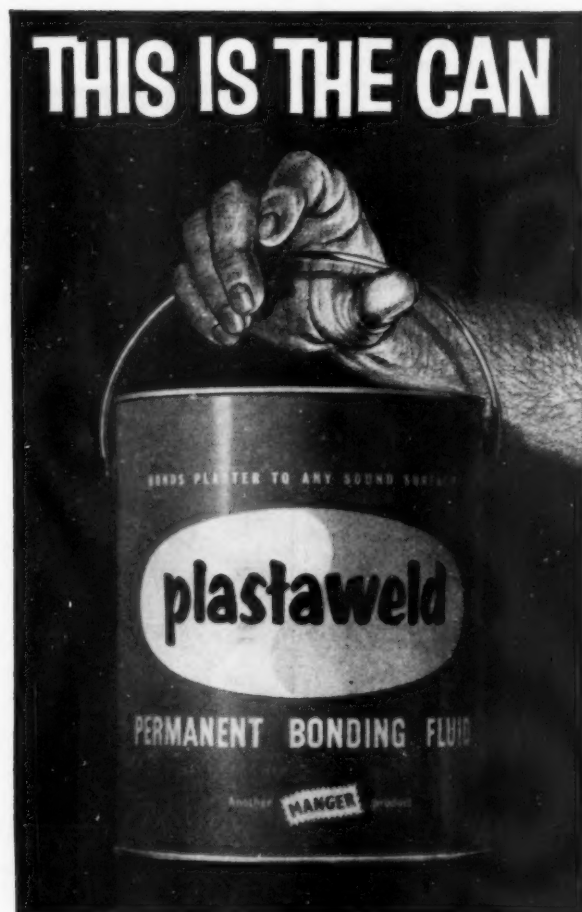
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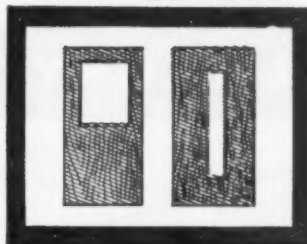
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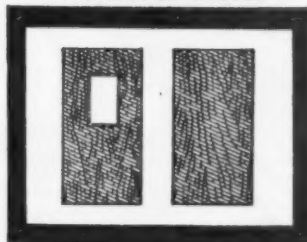
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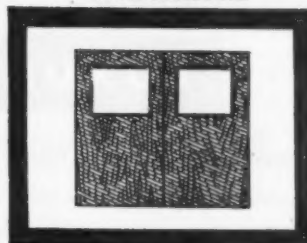
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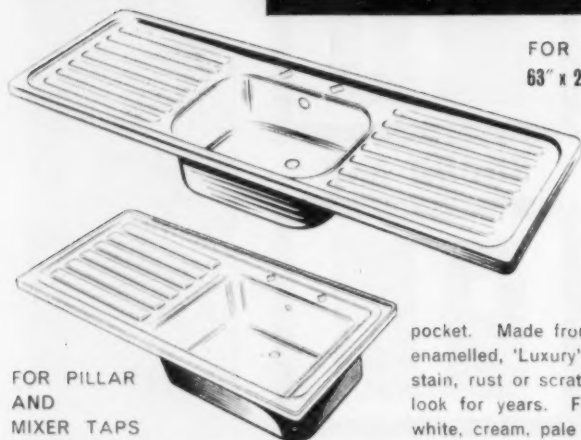


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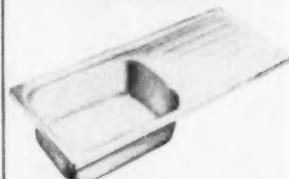
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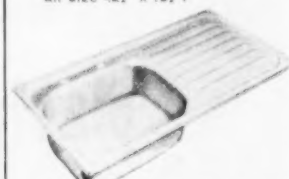


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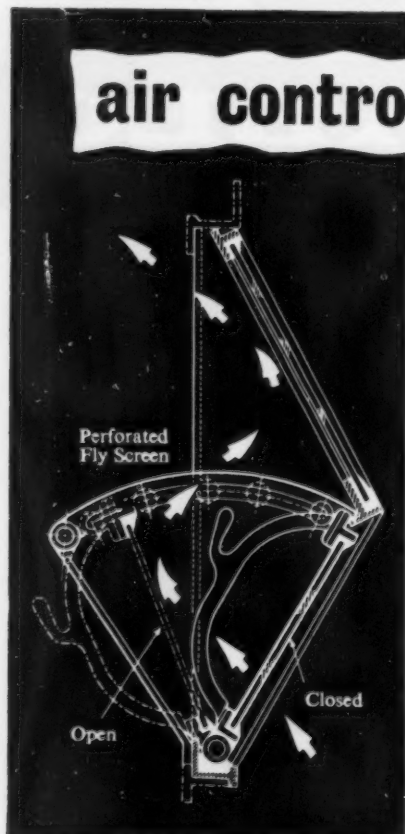
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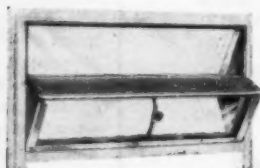
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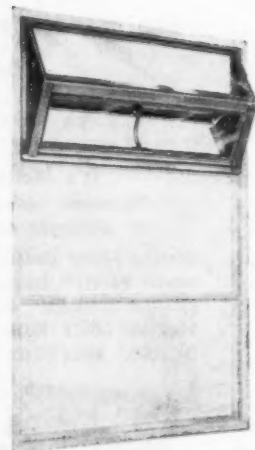
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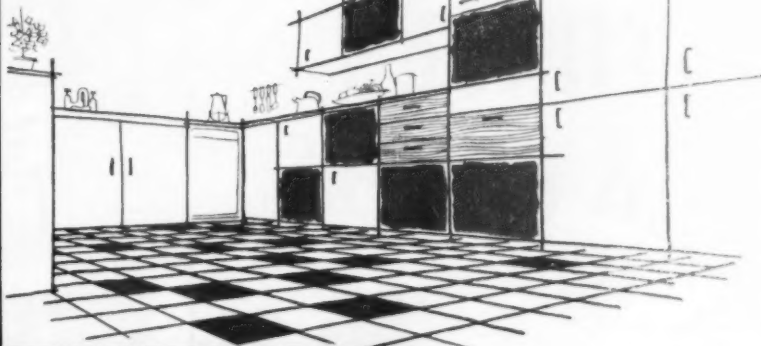
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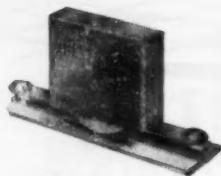
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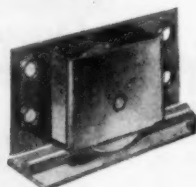
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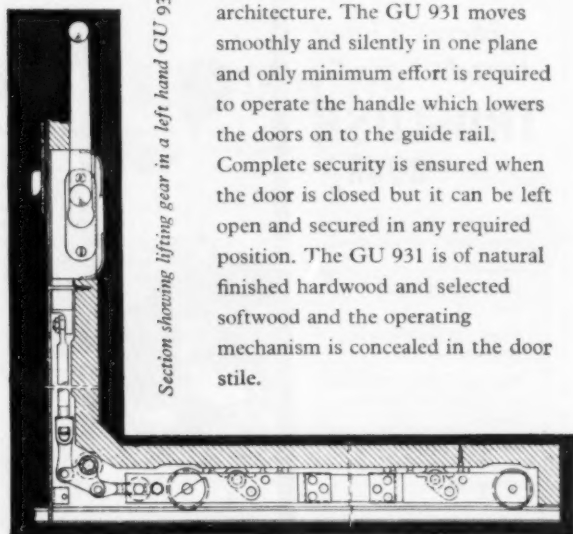


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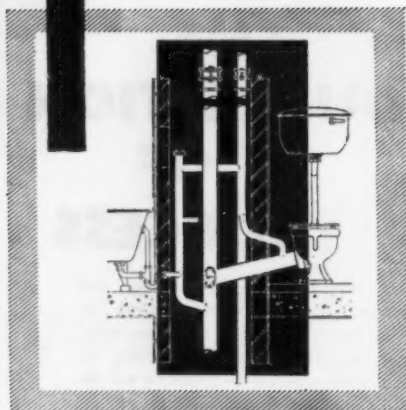


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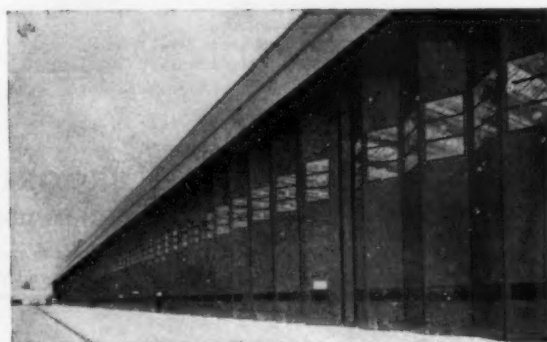


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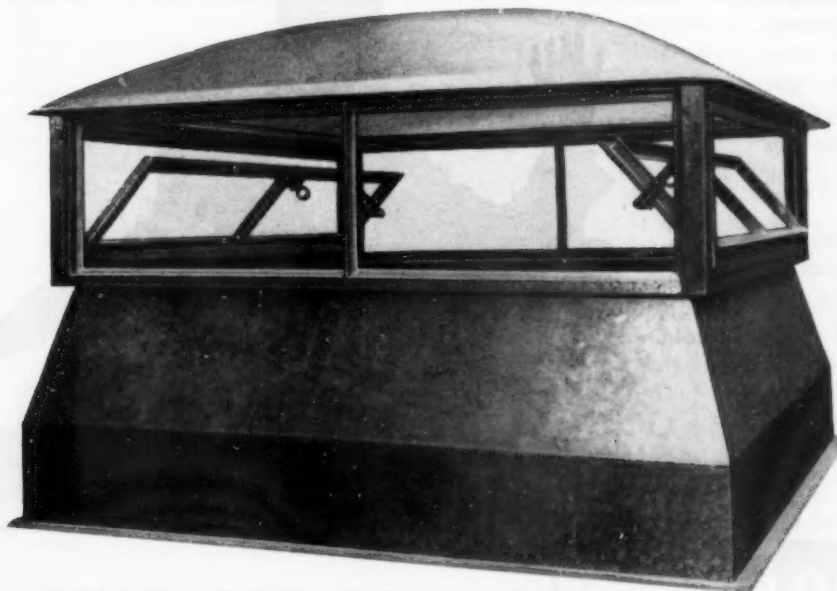
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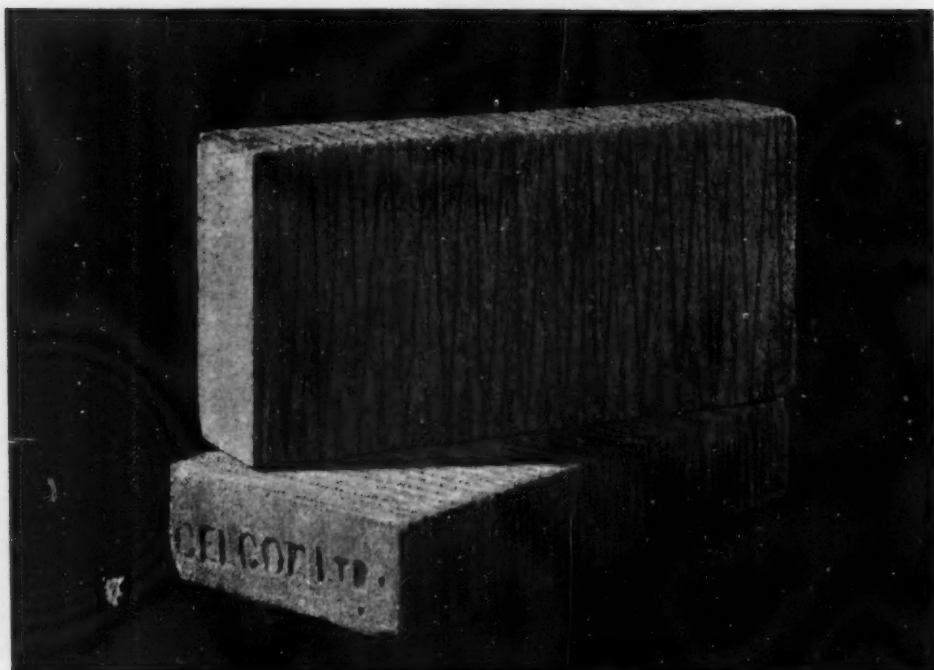


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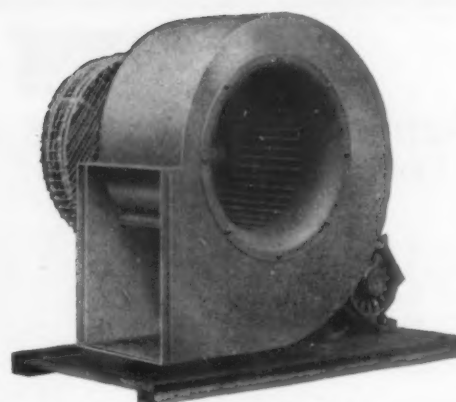
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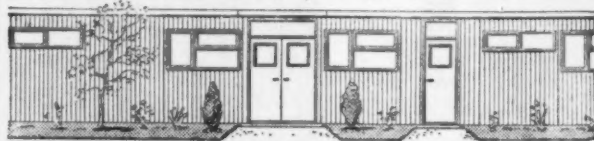
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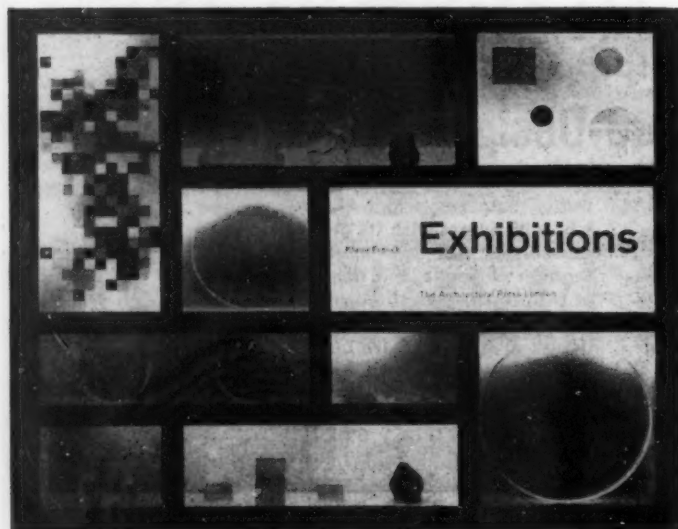
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PHILIP H. BARTLETT  
Town Clerk.

Guildhall,  
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### QUANTITY SURVEYORS OPPORTUNITIES OVERSEAS

AIR MINISTRY WORKS DEPARTMENT invites applications from chartered ASSISTANT QUANTITY SURVEYORS for appointments initially in overseas areas on tours of 2 or 3 years' duration according to location. Completion of tour is followed by duties in U.K. with every opportunity for further tours overseas.

SALARY overseas includes FOREIGN SERVICE ALLOWANCE which varies according to location and whether single or married. For example, total emoluments in Cyprus at age 25 range at present, from £1,316 to £1,766 (single) and from £1,676 to £2,361 (married). Annual increments to age 34 with a special increase of 495 p.a. for fully qualified men after 2 years' service.

CONDITIONS. Expatriation and kit allowances (£85 to £140 approx.). Free passage overseas for self and later for family when accommodation arranged. Free medical and child educational arrangements. 5 day week with paid annual leave initially 4 weeks and 2 days. Paid sick leave within certain limits.

PROSPECTS. Appointments are non-pensionable but retirement/resignation gratuity payable after 5 years' or more service. Excellent opportunities of obtaining permanent pensionable post (with all service counting) and of advancement to posts in the higher grades which number 130 approx. Higher grade salaries vary between £1,455 and £3,715 p.a. and vacancies are, as a rule, filled by promotion of existing staff.

Applicants, who must be natural born British subjects under 35 years of age should write to Air Ministry of Works Department (W.G.d.), Lacon House, Theobalds Road, London, W.C1. Selection will be by interview in London and certain expenses will be reimbursed. 9840

### CORPORATION OF KIRKCALDY BURGH ENGINEER'S DEPARTMENT ASSISTANT ARCHITECTS

Applicants must be A.R.I.B.A., and have a contemporary outlook on the design and layout of housing and other local authority buildings and the ability to supervise and control large scale contracts. Salary scale up to £1,325 with placing according to age and experience. Housing accommodation available. Posts pensionable. Medical Examination. Canvassing direct or indirect disqualifies. Declare relationship to member of Council or chief official. Applications, stating age, details of training, qualifications and experience, with names and addresses of two referees, to the Borough Engineer and Planning Officer, Town House, Kirkcaldy, by 15th December, 1961. 1249

HALTEPRICE URBAN DISTRICT COUNCIL

Applications are invited for an ARCHITECTURAL ASSISTANT in the Engineer and Surveyor's Department.

Candidates must be members of the R.I.B.A. and have suitable experience in the development of Council housing and other Council properties.

The commencing salary will be fixed within the scale A.P.T. IV (£1,140-£1,310) per annum, according to qualifications and experience. The successful applicant will work directly under the Engineer and Surveyor.

The appointment will be subject to one month's notice on either side; to the provisions of the Local Government Superannuation Acts; to National Conditions of Service and to satisfactory medical examination.

The Council is prepared to consider, if necessary, the provision of housing accommodation. Applications, giving the names of two referees, should reach the undersigned not later than first post on the 4th December, 1961.

A. B. GLASSPOOL,  
Clerk of the Council.

Anlaby House,  
Anlaby, E. Yorkshire. 1247

### SHROPSHIRE

There are vacancies for ARCHITECTS in the COUNTY ARCHITECT'S DEPARTMENT on all Grades up to the maximum of A.P.T. V (£1,480 p.a.). In addition to the usual building programme of new schools, police stations, welfare homes, etc., work in the Department includes the Newshire Hall (nearly £1,000,000) and the development of SCOLA.

Appointments are subject to the N.J.C. Conditions and a five-day week is in operation. A disturbance allowance or weekly separation allowance is payable to a married man taking up an appointment.

Architects interested in working in Shropshire are invited to write to the County Architect, Ralph Crowe, A.A.Dipl. A.R.I.B.A., A.M.T.P.I., Column House, London Road, Shrewsbury, giving details of their training, qualifications and experience. 1218



# CITY OF SALFORD

Applications are invited from appropriately qualified persons for the following posts in the Department of the City Engineer and Surveyor (G. Alexander McWilliam, B.Sc., A.M.I.C.E., A.R.I.C.S., M.I.Mun.E.).

- (a) PRINCIPAL PLANNING ASSISTANT, J.N.C. "A" (£1,410-£1,565 p.a.).
- (b) SENIOR TOWN PLANNING ASSISTANT, A.P.T. Grade V (£1,310-£1,480 p.a.).

The Department is undertaking programmes of redevelopment and urban renewal and the posts will afford a wide variety of interesting experience. The commencing salary will be dependent upon qualifications and experience.

Housing accommodation may be provided in approved cases.

Applications stating age, education, qualifications and details of experience, together with the names of two referees, should be sent to the City Engineer & Surveyor, Town Hall, Salford, 3, Lancs, to arrive by Monday, 4th December, 1961.

1242

## CITY OF SALFORD APPOINTMENT OF ARCHITECTS

Further vacancies now exist in the expanding Architects' Section in the Department of the City Engineer and Surveyor (G. A. McWilliam, B.Sc., A.M.I.C.E., A.R.I.C.S., M.I.Mun.E.). Applications are invited for the under-mentioned posts from keen and enthusiastic architects who are experienced in modern design and constructional techniques.

- (a) ASSISTANT ARCHITECTS, A.P.T. Grade V (£1,310-£1,480 p.a.). (2)
- (b) ASSISTANT ARCHITECTS, A.P.T. Grade IV/IV (£1,140-£1,480 p.a.). (2)
- (c) ASSISTANT ARCHITECT, A.P.T. Grade III/IV (£960-£1,310 p.a.). (1)
- (d) JUNIOR ASSISTANT ARCHITECTS, A.P.T. Grade I/III (£645-£1,140 p.a.). (3)
- (e) ARCHITECTURAL ASSISTANTS, A.P.T. Grade I/II (£645-£960 p.a.). (2)

The commencing salary will be dependent upon qualifications and experience.

The successful applicants will be engaged on a number of interesting projects, including the Broad Street Redevelopment Scheme covering 87 acres of the city centre, the city shopping precinct, and high density housing.

Housing accommodation may be provided in approved cases.

Applications, stating age, education, qualifications and details of experience, together with the names and addresses of two referees, should be sent to the City Engineer and Surveyor, Town Hall, Salford, 3, to arrive by Monday the 4th December, 1961.

1241

## CITY AND ROYAL BURGH OF DUNFERMLINE DEPUTY BURGH ARCHITECT AND TOWN PLANNING OFFICER

Applications are invited for the post of Deputy Burgh Architect and Town Planning Officer on the salary scale £1,165 x five annual increments of £45 to £1,390, with placing according to qualifications and experience.

Applicants should be qualified Members of the Royal Institute of British Architects, and also of the Town Planning Institute. Preference will be given to those with local authority and Town Planning experience.

The post is superannuable, and has been designated by the Town Council for priority housing. Detailed applications, giving names of two referees, should be submitted to Leonard Howarth, A.R.I.B.A., A.M.T.P.I., A.R.I.A.S., Burgh Architect and Town Planning Officer, 6 Abbot Street, Dunfermline, within seven days.

J. DOUGLAS,  
Town Clerk.

1251

## EAST RIDING OF YORKSHIRE COUNTY COUNCIL

Applications are invited for the appointment of ASSISTANT ARCHITECTS on the staff of the County Architect at salaries within A.P.T. Grades III/IV (£960-£1,310).

Particulars of qualifications, age, experience, past and present appointments with salaries, together with the names of three referees, should be sent to the County Architect, County Hall, Beverley, not later than Saturday, 9th December, 1961.

Assistance towards removal, lodging and travelling expenses may be granted.

R. A. WHITLEY,  
Clerk of the Council.

1265

## CITY OF NEW SARUM CITY ENGINEER'S DEPARTMENT CIVIL ENGINEERING INSPECTOR

Applications are invited for the appointment of Civil Engineering Inspector to assist the Resident Engineer in the supervision of the construction of a new sewage treatment plant in Salisbury. Preference will be given to applicants with experience of large scale concreting operations. The appointment will be for a period of two years at a salary of £15 per week. A casual user's car allowance will be paid.

Applications, giving full details of experience, together with the names and addresses of two referees, should be sent to the City Engineer and Surveyor, The Council House, Bourne Hill, Salisbury, to be received not later than Monday, 4th December, 1961.

GEORGE RICHARDSON,  
Town Clerk.  
S1164

# COUNTY BOROUGH OF BURNLEY

Applications are invited for the following appointments in the Borough Engineer and Surveyor's Department:—

- (a) JUNIOR ARCHITECTURAL ASSISTANT, A.P.T. Grade I/II (£645-£960 per annum). Applicants should hold suitable qualifications and the commencing salary and grade will be fixed in accordance with experience and qualification.

- (b) QUANTITY SURVEYING ASSISTANT, A.P.T. Grade I (£645-£815 per annum). Applicants should have a sound knowledge of building construction and some experience in the preparation of Quantities and Measurement of Work is essential.

Forms of application etc. may be obtained from the Borough Engineer, 22/24 Nicholas Street, Burnley, to whom they should be returned not later than Friday, 8th December, 1961.

C. V. THORNTON,  
Town Clerk.  
1229

## THE UNIVERSITY OF MANCHESTER

Applications are invited for a post of LECTURER IN TOWN AND COUNTRY PLANNING. Applicants must be graduates in Planning or in an allied subject and be corporate members of the Town Planning Institute. Experience in planning aspects of traffic and highway engineering would be an additional recommendation. Salary on a scale £1,050 to £1,850 per annum with membership of the F.R.S.U. and Children's Allowance Scheme; initial salary according to qualifications and practical experience. Applications should be sent not later than January 20th, 1962, to the Registrar, the University, Manchester 13, from whom further particulars and forms of application may be obtained.

S1243

## HARLOW DEVELOPMENT CORPORATION Architect/Planner: FREDERICK GIBBERD, C.B.E., F.R.I.B.A., M.T.P.I.

Executive Architect: VICTOR HAMNETT, B.Sc., A.R.I.B.A., Dip.T.P., A.R.I.C.S., A.M.T.P.I.

Applications invited for the post of ARCHITECT, Grade A.P.T. V. Salary £1,310-£1,480 per annum.

Candidates should have an all-round general architectural experience and have the ability to work with a team on building projects from inception to completion mainly in connection with contemporary housing and flat development and the development of a Neighbourhood Shopping Centre.

Applications stating age, training, qualifications and experience together with the names of two referees to be forwarded to the General Manager, Terlings, Harlow, Essex, to reach him by 1st December, 1961. It is anticipated that the successful candidate will be required to take up his duties on or before 1st February, 1962.

Housing accommodation to rent will be made available in appropriate cases in due course. 1196

## BASILDON DEVELOPMENT CORPORATION DEPARTMENT OF ARCHITECTURE AND PLANNING

Applications are invited from ARCHITECTS for the following posts:—

- (a) SENIOR ARCHITECT to lead the work of the Town Centre and Industrial Section. Outstanding design ability and experience in the control of large projects is essential for this job requiring a comprehensive approach. Grade A.P.T. IX. Salary within the range £1,715-£1,975 per annum.
- (b) GROUP LEADER for a group engaged on design and contract management of Town Centre, Industrial or Housing projects. Grade A.P.T. VI/VII. Salary within the range £1,305-£1,670 per annum.
- (c) ASSISTANT ARCHITECTS to join groups engaged on projects as described in (b). Grades A.P.T. III, IV and V. Salary within the range £960-£1,480 per annum, according to ability and experience.

The new Town is about halfway towards its ultimate population of 106,000 and all the posts offer an exciting opportunity for Architects to undertake varied and advanced work on new development schemes.

The appointments are superannuable and subject to medical examination.

A house or flat is available.

Applications giving full details should be returned to the General Manager, Basildon Development Corporation, Gifford House, Basildon, Essex, by not later than Thursday, 30th November, 1961.

1204

## HACKNEY BOROUGH COUNCIL ENGINEER AND SURVEYOR'S DEPARTMENT VACANCIES FOR ARCHITECTURAL STAFF

Applications are invited for permanent appointments of

ASSISTANT ARCHITECTS AND ARCHITECTURAL ASSISTANTS in the Architectural Section of the Department in Grades ranging between A.P.T. II (£815-£960 p.a.) and A.P.T. V (£1,310-£1,480 p.a.) plus London weighting allowance.

Grading and commencing salaries will be fixed according to training qualifications and experience.

The Department has on hand a heavy and varied programme of Housing Development and other architectural projects.

In appropriate cases the Council will be prepared to consider 100 per cent. advances for house-purchase within or without the Borough.

Application forms obtainable from Town Clerk, Town Hall, Hackney, London, E.8, returnable by 9 a.m., 2nd December, 1961.

S1158

# CITY AND COUNTY OF

## NEWCASTLE UPON TYNE CITY ARCHITECTS' DEPARTMENT

A unique opportunity exists in this office to take part in one of the most ambitious programmes of varied building works in the country, and vacancies in the establishment occur as follows:—

ARCHITECTS—who will be considered on their ability in design, experience and architectural outlook.

J.N.C. "D" £1,710-£1,975 per annum. (New Town Hall Section.)

J.N.C. "C" £1,560-£1,825 per annum. (General Section and Re-housing Sections.)

J.N.C. "B" £1,410-£1,670 per annum. (Housing Section.)

J.N.C. "A" £1,365-£1,565 per annum. (Housing Section.)

A.P.T. V £1,310-£1,480 per annum. (General, Education, Housing, Re-Housing and New Town Hall Sections.)

A.P.T. IV £1,140-£1,310 per annum. (General, Education and Housing Sections.)

A.P.T. III £960-£1,140 per annum. (General, Housing and Re-Housing Sections.)

A.P.T. II £815-£960 per annum. (General and Re-Housing Sections.)

A.P.T. I £645-£815 per annum. (Housing and Re-Housing Sections.)

The Department is engaged upon a wide and varied programme of major redevelopment schemes, embracing multi-storey flats, shopping precincts and associated community buildings, one of which schemes is the Scotswood Road Redevelopment Area to re-house approximately 5,000 people, and which is expected to cost in the region of £12 million.

Planning work has now commenced on the new Education Precinct in the central area, comprising Colleges of Further Education, Art and Industrial Design, Drama, Commerce, and Multi-storey Hostels, which will be the largest development of its kind in the country.

Further projects include: Airport Terminal; Abattoir and Fatstock Market; Vegetable Markets; Central Library; and Divisional Police Headquarters, etc., and a varied programme of normal Housing development of a stimulating character.

The Department is also engaged on the New Town Hall, where an exceptional opportunity is presented for working on a building of some £4 million in value, and being executed in materials of the highest quality.

Applicants will be considered on their ability in design, experience and capacity to carry out creative work, and the successful candidate will be required to prepare comprehensive schemes of Landscaping for the major Redevelopment Areas, Housing Estates, New Town Hall, Education Precinct, etc.

Applicants for posts in A.P.T. III and above must have appropriate professional qualifications. The City Council has agreed (a) to pay 50 per cent. of the total cost of removal expenses of successful candidates up to a maximum grant of £50 in those cases where the Committee feels it is warranted, subject to the successful candidate remaining in the post for a minimum period of two years from the date of taking up the appointment, otherwise refund of the grant will be required; (b) to offer the successful candidates, in cases where the Committee deems it is warranted, the tenancy of a dwelling to be let at an economic rent and (c) draw candidates' attention to the facilities under the Council's scheme for advance on mortgage, whereby in approved cases a loan for the purchase of a house up to 100 per cent. of valuation may be granted by the Council. Those wishing to take part in one of Britain's most stimulating programmes should apply immediately for further details and forms of application to George Kenyon, A.R.I.B.A., A.M.T.P.I., City Architect, 15 Cloth Market, Newcastle upon Tyne 1, indicating the grade for which they wish to be considered.

JOHN ATKINSON,  
Town Clerk.

Town Hall,  
Newcastle upon Tyne, 1.  
2nd October, 1961.

TC9623

## FROME URBAN DISTRICT COUNCIL

Applicants are invited for the appointment of an ARCHITECTURAL ASSISTANT in the Engineer & Surveyor's Department.

Applicants should have completed their professional training and be studying for professional qualifications.

The salary will be in accordance with A.P.T. II (£815-£960) the commencing point being according to qualifications and experience. A casual user's car allowance is payable to the successful applicant.

The appointment is subject to the National Conditions of Service. The Council operate a five-day working week and are prepared to consider the provision of a Council house if required.

Applications stating age, qualifications and experience together with the names of two referees should be sent to the Engineer & Surveyor, Municipal Offices, North Hill, Frome, not later than Friday, 8th December, 1961.

A. W. YOUNG,  
Clerk of the Council.

Municipal Offices,  
North Hill,  
Frome.  
14th November, 1961.

1219



**COUNTY BOROUGH OF CROYDON**

Applications are invited for the following appointments:  
**ARCHITECTURAL ASSISTANTS** to assist in the Council's extensive and varied building programme. Grades A.P.T. III/IV—£1,005 to £1,355 per annum.

Good general training necessary. Intermediate qualification not essential. The commencing salary will be according to qualifications and experience of the successful applicant. Pensionable posts. Five-day week. Assistance with housing accommodation will be considered. The Section (H. Thornley, A.R.I.B.A., Principal Architect) is organised on a group basis. Application forms from the Borough Engineer, Town Hall, Croydon. Closing date 4th December, 1961. 1256

**UNIVERSITY OF EDINBURGH  
DEPARTMENT OF ARCHITECTURE  
LECTURESHIP**

Applications are invited for the post of Lecturer in the Department of Architecture. The duties will include responsibility for Fifth Year Architectural Design, and tutorials on the theory of Architecture.

Salary Scale £1,050 × £50 to £1,250; Bar: £1,300 × £50 to £1,400 × £75 to £1,850 per annum, with placement according to qualifications and experience, and with superannuation benefit and family allowance where applicable.

The successful candidate will be expected to take up duty on 1st January, 1962, or as soon as possible thereafter.

Further particulars may be obtained from the undersigned, with whom applications (six copies), giving the names of two referees, should be lodged not later than 5th December, 1961.

CHARLES H. STEWART,  
Secretary to the University.

November, 1961. 1173

**BOROUGH OF MALDEN AND COOMBE  
BOROUGH ENGINEER AND SURVEYOR'S  
DEPARTMENT**

Applications are invited for the appointment of **JUNIOR ARCHITECTURAL ASSISTANT**, Grade A.P.T. II (£815—£960 per annum, plus London weighting).

Applications on forms to be obtained from John Apse, A.M.I.C.E., Borough Engineer and Surveyor, Municipal Offices, New Malden, Surrey, should be returned by not later than Monday, 11th December, 1961.

HAROLD E. BARRETT,  
Town Clerk.

Municipal Offices,  
New Malden,  
Surrey. 1188

**COUNTY COUNCIL OF DUNBARTON**

Applications are invited for the following posts in the County Architect's Department of the County Council:  
**SENIOR ASSISTANT ARCHITECTS**  
 £1,295 to £1,475 per annum.  
**ASSISTANT ARCHITECTS**  
 £850 to £1,270 per annum.  
**ASSISTANT ARCHITECTS**  
 (Part Qualified)  
 £640 to £845 per annum.

Applicants for the posts of Senior Assistant must be A.R.I.B.A., preferably with considerable experience in housing, schools and other local authority work. The posts are superannuable. Placing on the scale will be given to Assistant Architects according to experience and qualifications. Five-day week. The provision of housing accommodation will be considered. Canvassing in any form will disqualify and relationship to any member or senior officer of the County Council must be disclosed.

Applications, stating age, experience and qualifications, along with the names and addresses of two referees, should be lodged with the County Architect, Ferry Road, Old Kilpatrick, within 14 days from the date of this advertisement.

JOHN F. MILLER,  
County Clerk.

County Buildings, Dunbarton. 1194

**BOROUGH OF ENFIELD  
BOROUGH ENGINEER & SURVEYOR'S  
DEPARTMENT****AMENDED ADVERTISEMENT**

(Population 110,000—Area 12,400 acres)  
 Applications are invited for the following appointments:

- (a) **ASSISTANT ARCHITECTS**—Grade A.P.T. V (£1,310—£1,480 n.a.).  
 (b) **ASSISTANT ARCHITECT**—Grade A.P.T. IV (£1,140—£1,310 n.a.).

The appropriate London weighting allowance will be paid in addition to the above salaries, which will be fixed at a point within the Scale commensurate with qualifications and experience. Candidates for post (a) must be Associates of the Royal Institute of British Architects, and should have wide experience in the design and administration of major building works.

The Council are prepared to consider the provision of housing accommodation if required, or 100 per cent. advances to successful applicants for house purchase within the Borough.

Five-day week.  
 Details of appointments and application forms obtainable from H. D. Peake, M.Sc. (Eng.), Borough Engineer and Surveyor, 7, Little Park Gardens, Enfield, Middx., to be returned not later than 11th December, 1961.

CYRIL E. C. R. PLATTEN,  
Town Clerk.

Civic Centre  
 Enfield, Middx. 81162

**WEST SUFFOLK COUNTY COUNCIL**

Applications are invited from persons experienced in a County Planning Department for the post of Area Planning Assistant on Grade A.P.T. II (£815—£960). N.J.C. conditions of service, medical examination; five-day week; schemes for payment of removal expenses and housing separation allowances in operation; car essential.

Applications, giving personal particulars and experience, and naming two referees, to County Planning Officer, Shire Hall, Bury St. Edmunds, by 4th December, 1961. 1175

**BOROUGH OF MORECAMBE AND HEYSHAM**

Applications are invited for the position of **SENIOR ARCHITECTURAL ASSISTANT** at a salary in accordance with A.P.T. III (£960—£1,140 p.a.).

Application forms obtainable from Borough Engineer and Surveyor.

Canvassing will disqualify.

Closing date 5th December, 1961.

C. E. BOTTOMLEY,  
Town Clerk.

15th November, 1961. 1234

**ROYAL BURGH OF INVERNESS  
BURGH ARCHITECTS AND TOWN  
PLANNING DEPARTMENT****APPOINTMENT OF  
SENIOR ASSISTANT ARCHITECT**

Applications are invited for the above appointment. Salary scale Admin. Div. Grade "B/D." £975—£1,200 with placing according to experience. Applicants should be A.R.I.B.A., with a flair for modern design. The post offers a valuable opportunity of obtaining experience in Housing, Town Planning and all allied Local Authority work. Housing accommodation will be provided.

The post is superannuated. Medical examination. Applications, together with the names of two referees, to be lodged with the Burgh Architect, 11, High Street, Inverness, within ten days of the publication of this advertisement.

JAMES CAMERON,  
Town Clerk.

Town House,  
Inverness.

9th November, 1961. 1174

**BOROUGH OF ENFIELD  
BOROUGH ENGINEER & SURVEYOR'S  
DEPARTMENT****AMENDED ADVERTISEMENT  
APPOINTMENT OF CHIEF PLANNING  
ASSISTANT—J.N.C. SCALE "B"**

(£1,525 × £75 × £70—£1,670 per annum)

Applications are invited for the above post. The Borough has a population of 110,000 and an area of 12,400 acres, of which 2,750 acres are preserved as Green Belt plus approximately 1,000 acres as parks and public open spaces. The Department has under preparation Schemes of Comprehensive Development including the re-planning of the Town Centre and the lay-out of an Industrial Estate.

The successful applicant will be a Section Head and must have considerable ability, leadership and imagination.

All applicants must have passed the Final Examination of the Town Planning Institute, and Membership of another related professional body will be considered an advantage. Experience in the control of Staff, Committee work, Planning Inquiries and general administration is essential.

The appropriate London weighting allowance will be paid in addition to the above salary, which will be fixed at a point within the Scale commensurate with qualifications and experience. An "Essential Car Users" allowance is payable in connection with the duties of the post.

The Council are prepared to consider the provision of housing accommodation if required, or 100 per cent. advance to the successful applicant for house purchase within the Borough.

Five-day week.  
 Details of appointment and application form obtainable from H. D. Peake, M.Sc. (Eng.), Borough Engineer and Surveyor, 7, Little Park Gardens, Enfield, Middx., to be returned not later than 11th December, 1961.

CYRIL E. C. R. PLATTEN,  
Town Clerk.

Civic Centre,  
 Enfield, Middx. 81163

**CITY OF LEICESTER  
CITY ARCHITECT'S DEPARTMENT****GROUP LEADER ARCHITECTS, Scale "A."**

£1,340—£1,565.

**SENIOR ASSISTANT ARCHITECTS, A.P.T. IV/V, £1,140—£1,480**

**LANDSCAPE ARCHITECT, A.P.T. IV/V, £1,140—£1,480**

**ASSISTANT ARCHITECTS, A.P.T. III/IV, £960—£1,310.**

Housing accommodation where appropriate. Five-day week.

Applications invited from good Architects wanting to work on a group basis in a modern office on progressive schemes for schools, large scale housing projects and almost every kind of city development.

Closing date: Tuesday, 5th December, 1961.

Form of application from:

J. H. LLOYD OWEN,  
B.Arch., F.R.I.A.

Halford House,  
 Charles Street,  
 Leicester. 81170

**CITY OF NOTTINGHAM**

Applications are invited for the following posts in the Planning Section of the City Engineer's Department:

- (a) **ASSISTANT PLANNING OFFICER.**

A.P.T. V, £1,310—£1,480 per annum.

Applicants should hold a Town Planning or an Architectural qualification. There is a large volume of Creative Planning work on hand with a strong emphasis on Central Area Redevelopment with scope for original and imaginative ideas.

- (b) **TOWN PLANNING ASSISTANT.**

A.P.T. II, £815—£960 per annum.

Applicants should be either an experienced draughtsman capable of preparing first class work for litho reproduction or a young man intending to qualify as an A.M.T.P.I. and who has made some progress with his studies. Commencing salary for each post will depend on experience and qualifications.

Applications on forms to be obtained from the City Engineer and Surveyor, Guildhall, Nottingham, are to be returned to him by Friday, 8th December, 1961. 81220

**AIR MINISTRY WORKS DEPARTMENT**

invites applications for **ARCHITECTURAL ASSISTANTS**, primarily for the architectural branch of the designs office in London.

**SALARY (Inner London Scale):**

Grade II: £1,048—£1,220.

Grade III: £658—£1,048 (£866 at age 25).

Starting salary depends on age, qualifications and experience.

**Qualifications and Experience:** The work includes wide range of domestic, administrative and technical buildings in varying forms of construction offering scope for imaginative design for which adequate training and architectural office experience is necessary. O.N.C. (Bldg.) some advantage for Grade III posts but progressive design ability is sought for Grade II. Financial assistance and time off may be allowed for recognised courses of study, e.g., R.I.B.A.

**Prospects:** Appointments are non-pensionable (retirement/resignation gratuity payable after five years' or longer service) but good opportunities exist both for establishment to pensionable posts, when all service counts, and for advancement to the higher grades in which posts number some 35. Higher grade salaries vary between £1,277 and £2,015 (inner London scale) and vacancies are, as a rule, filled by promotion of serving staff. Opportunities for tours of duty overseas, when additional allowances ranging, at present, up to £1,800 p.a. (depending on circumstances) are payable. Five-day week with 26½ days' paid leave per year initially including public holidays.

Applicants, who must be natural born British subjects, should write to AIR MINISTRY, W 6 (d), LAYTON HOUSE, THEOBALDS ROAD, LONDON, W.C.1. or to any Employment Exchange (quoting Kings Cross, 838) giving age, details of training, qualifications and full particulars of former posts held. Candidates selected will normally be interviewed in London and certain expenses reimbursed. 89466

**AIR MINISTRY WORKS DEPARTMENT**

invites applications for **QUANTITY SURVEYING ASSISTANT**, Grade III, posts at R.A.F. and Ministry of Aviation stations throughout the United Kingdom.

Salary (National Rate) Grade III, £697—£988 (£749 at age 25). Starting salary depends on age, qualifications and experience.

**Qualifications and Experience:** Work includes abstracting and billing, site measurement and preparation of estimates. Candidates who must be natural born British subjects must hold O.N.C. (Building or Builders Quantities) or equivalent and have had good experience under Quantity Surveyor or Building Contractor. Knowledge of W.D. schedule an advantage. Financial assistance and time off allowed for recognised courses of study leading to higher qualifications.

**Prospects:** Appointments are non-pensionable (retirement/resignation gratuity payable after five years' or longer service) but good opportunities exist both for establishment to pensionable posts, when all service counts, and for advancement to the higher grades in which posts number some 180. Higher grade salaries vary between £988 and £1,747 (National rate) and vacancies are, as a rule, filled by promotion of serving staff. Opportunities for tours of duty overseas, when additional allowances ranging, at present, up to £1,800 p.a. (depending on circumstances) are payable in addition to a higher salary. Five-day week with 26½ days' paid leave per year initially including public holidays.

Forms from Manager (PE.2), Ministry of Labour, Professional & Executive Register, Atlantic House, Farringdon Street, London, E.C.4. Candidates selected will be interviewed in Air Ministry, London, and certain expenses reimbursed. 89987

**AMENDED ADVERTISEMENT  
BOROUGH OF ACCRINGTON****ARCHITECTURAL ASSISTANT**

A.P.T. V (£1,310—£1,480)

Applicants must be Associate Members of the R.I.B.A. and have had experience in preparation of drawings and specifications and be capable of assuming responsibility for medium to large scale contracts.

Commencing salary according to experience.

Housing provided if required.

Interesting programme of large capital works. Applications with names of two referees to Town Clerk, Town Hall, Accrington, by 9 a.m. on Monday, the 11th December, 1961. 1282



## QUANTITY SURVEYING ASSISTANTS

required by

**ADMIRALTY  
WAR OFFICE  
AIR MINISTRY  
MINISTRY OF WORKS  
DEPARTMENT OF SCIENTIFIC  
AND INDUSTRIAL RESEARCH**

Posts in London, Provinces and overseas. Salaries in London for candidates with suitable experience range from £752 p.a. at age 21 to £1,188 p.a. Write for particulars of vacancies in each department, and forms, to Ministry of Labour, Technical and Scientific Register (Room 403), 28, King Street, London, S.W.1.

## EXPERIENCED ARCHITECTURAL ASSISTANTS and DRAUGHTSMEN

Required for heavy programme of building development.

Good working conditions in pleasant surroundings. 5-day week. Progressive salaries commensurate with age and ability. Continuous employment. Pension scheme. Staff canteen.

Interviews to suit applicants.

Write :—

**District Architect,  
F. W. WOOLWORTH and CO., LIMITED  
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London, S.W.16**



**BRITISH TRANSPORT COMMISSION**

## ARCHITECT'S OFFICE

*Applications are invited for the following posts for work on a varied and interesting programme including major development projects:—*

- (a) Senior Assistant Architect —  
Salary Range: £1,350 - £1,560
- (b) Leading Assistant Architects —  
Salary Range: £1,230 - £1,350
- (c) Assistant Architects —  
Salary Range: £1,070 - £1,145

Candidates for (a) and (b) must be Associate Members of R.I.B.A. with good general experience in design and construction.

Candidates for (c) should have completed their final examinations.

Superannuation scheme; certain travel facilities; medical examination.

Write stating age, qualifications and experience to Director of Establishment, British Transport Commission, 222, Marylebone Road, London, N.W.1 within 14 days.

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‘Acanthus’, the well-known artist and cartoonist, depicts fictitiously life in a stately home. His detailed architectural drawings and sense of humour combine to give this volume the seasonable quality such a gift demands for those who delight in visiting stately homes and those who merely laugh at themselves.

Price **12/6** Post Free



The Builder Bookshop,  
4 Catherine St., Aldwych, W.C.2.



**THE COUNTY BOROUGH OF NEWPORT** is establishing a separate Town Planning Department under the control of a Borough Planning Officer with Chief Officer status and invites applications for the appointment of:

**DEPUTY BOROUGH PLANNING OFFICER** at a salary £1,343 6s. 8d. rising to £1,563 6s. 8d., which is fixed at two thirds of the salary of the Chief Officer.

The new Department will be undertaking a full, varied and interesting programme including redevelopment and a complete review of the Development Plan.

Applicants must be fully qualified with wide experience in all aspects of planning including the control of development.

Applications in envelopes suitably endorsed and accompanied by two recent testimonials should be submitted to the undersigned by not later than the 6th December, 1961.

J. G. ILES,  
Town Clerk.

Civic Centre,  
Newport, Monmouth. 1257

**MIDLANDS ELECTRICITY BOARD**  
**GENERAL ASSISTANT ENGINEER** (Architectural Draughtsman) required on the Chief Engineer's staff at Headquarters.

Duties will involve (under supervision) site surveys, preparation of site layouts, sketch plans, detail and working drawings for office blocks, stores, workshops, garages and Service Centre buildings. Intermediate R.I.B.A. an advantage. Salary £890—£1,015 per annum (N.J.B. Grade K.13). Superannuable.

Apply, by letter within 14 days, stating age, experience, present position and salary, to the Secretary, Midlands Electricity Board, Mucklow Hill, Halesowen, Nr. Birmingham.

F. W. CATER,  
Secretary. 1258

**METROPOLITAN BOROUGH OF STOKE NEWINGTON**

**APPOINTMENT OF ASSISTANT ARCHITECT**  
A.P.T. IV, £1,140 to £1,310 plus £45 L.W.

Applications are invited for the above appointment in the Architectural Section of the Borough Engineer and Surveyor's Department. Applicants must be Associate Members of the R.I.B.A. with at least three years' experience since qualifying. An advanced contemporary outlook with first class ability in design and construction is essential. The present work of the department includes multi-storey flats and public buildings, together with design of a new swimming bath.

Housing accommodation cannot be provided. Forms of application obtainable from the Town Clerk, Town Hall, Stoke Newington Church Street, London, N.16. 1259

**RE ADVERTISEMENT**  
**THE URBAN DISTRICT COUNCIL OF ESTON**

**APPOINTMENT OF**  
**JUNIOR ARCHITECTURAL ASSISTANT**  
Grade A P.T. II (£815—£960)

Applications are invited for the above appointment. Applicants should have housing experience and preference will be given to candidates who possess appropriate qualifications. The Council will consider favourably where necessary a request for housing accommodation.

The appointment will be subject to the provisions of the Local Government Superannuation Acts, one month's notice on either side and the passing of a medical examination.

Applications giving particulars of age, training, qualifications and experience, together with names of two referees, should reach me by 5th December, 1961.

N. C. HARRISON, A.M.I.C.E., M.I.Man.E.,  
Engineer and Surveyor's Department.

Town Hall,  
Fabian Road,  
South Bank, Middlesbrough. 1212

**CHERTSEY URBAN DISTRICT COUNCIL**

Applications are invited for the appointment of **CHIEF ASSISTANT ARCHITECT** (A.P.T. V, £1,310—£1,480 per annum) from Associates of the Royal Institute of British Architects.

The work is principally multi-storey housing but schemes for libraries, a community centre and swimming bath are included in the next five years' programme. Good opportunity for individual responsibility and initiative.

Housing available if required.

The appointment is permanent and pensionable. Applications giving details of experience, etc., to N. C. Goldsmith, M.B.E., M.I.Man.E., F.R.S.A., "The Orchard," Staines Lane, Bertsey, Surrey, not later than 5th December, 1961. 1263

**DEVON COUNTY COUNCIL**

**PLANNING DEPARTMENT**  
Devon County Council require the following staff in their County Planning Department Headquarters at Exeter:

(a) **PLANNING ASSISTANT**, A.P.T. II, £815—£960. In Development Plan Section. This is the senior post below the qualified grades.

(b) **PLANNING ASSISTANT**, A.P.T. I, £645—£815. In the Specialist Section. Graduate in subject related to landscape preferred as work includes visual aspects of mineral operations, holiday industry, and advertisement projects.

(c) **PLANNING ASSISTANT**, A.P.T. I, £645—£815. In Specialist Section—ability in draughtsmanship and presentation required.

Forms of application returnable by 2nd December, 1961, from the County Planning Officer, Bellair, Topsham Road, Exeter, Devon. 1273

**BOROUGH OF WORTHING**  
**BOROUGH ARCHITECT'S DEPARTMENT**  
Applications are invited for the following appointment:—

**ARCHITECTURAL ASSISTANT**, Grade A.P.T. III (£960—£1,140). (Salary according to qualifications and experience.)

The appointment will be subject to the National Joint Council's Scheme of Conditions of Service and to the Local Government Superannuation Acts. Housing accommodation will be made available, where appropriate, and removal expenses paid.

Applications, stating age, present position and salary, qualifications and experience, and the names of two referees, to be sent to the Borough Architect, "Heathcote," Christchurch Road, Worthing, within 10 days of the appearance of this advertisement.

ERNEST G. TOWNSEND,  
Town Clerk. 1260

**ISLE OF ELY COUNTY COUNCIL**  
**COUNTY ARCHITECT'S DEPARTMENT**

Applications are invited for the following appointments:—

**CHIEF ASSISTANT ARCHITECT**—Grade A/B (£1,315—£1,670) with essential user car allowance. Applicants must be A.R.I.B.A.

**ASSISTANT ARCHITECTS**—A.P.T. III or A.P.T. IV according to experience. Applicants should be A.R.I.B.A. or have completed Parts I and II of the R.I.B.A. Final Examination, or have satisfactorily completed a course at a School of Architecture.

In fixing commencing salaries for the above posts, ability and experience will be taken into account. All posts are subject to N.J.C. Conditions and the passing of a medical examination.

Application forms and further particulars may be obtained from the County Architect, County Hall, March, Cambs., to whom they should be returned by not later than 30th November, 1961.

R. F. G. THURLOW,  
Clerk of the County Council. 1269

County Hall,  
March. 1269

**KWAME NKURUMAH UNIVERSITY OF SCIENCE & TECHNOLOGY**  
KUMASI—GHANA

Applications are invited for the post of **QUANTITY SURVEYOR** in the Architects Office under the direction of the Senior Architect.

Qualifications: Candidates must be Associate Members of the Royal Institute of Civil Surveyors or must possess similar qualifications. In addition, they must have had at least three years' practical experience after gaining qualification. Experience acquired in West Africa desirable but not essential.

Duties will include preparation of estimates, bills of quantities, cost analysis, monthly valuations, adjustment of final accounts and other work incidental to such an appointment.

Appointments are normally for five years and may be renewed; three months' notice of resignation or termination of an appointment is required on either side.

Contract Salary Scales are:

Ghanaian: £61,156 5/-—£62,031 5/-.

Expatriate: £61,386—£62,508.

Children's allowances are paid in respect of Expatriates up to a maximum of five at the rate of £650 per annum per child up to the age of 10 years and £6100 per annum per each dependent child over 10 years of age in full-time education up to a maximum of 12 years of age.

The University is fully residential and members of staff are normally housed in pleasant modern bungalows on the spacious campus; climate and living conditions are good.

Annual leave with three free return passages in four years is granted to members of staff and their families.

Application forms may be obtained from the Assistant Registrar, Kwame Nkrumah University, 29, Tavistock Square, London, W.C.1, who will also be glad to answer any questions about living conditions in Ghana. Completed application forms in triplicate together with two recent testimonials should reach him not later than 26th December, 1961. 1274

## Competition

3s. per inch; each additional line 3s.

**THE UNIVERSITY OF LIVERPOOL**

**OPEN COMPETITION**

Architects are invited to submit designs for halls of residence for 1,100 to 1,200 students on the Carnatic site at Moseley Hill, Liverpool. The cost of the works will be approximately £1,500,000.

**Assessors:** Sir James Mountford, M.A., D.Litt., D.C.L., LL.D. (Vice-Chancellor).

Donald Gibson, C.B.E., M.A., D.C.L., F.R.I.B.A., M.T.P.I.

Professor Myles Wright, M.A., F.R.I.B.A., M.T.P.I.

**Premiums:** £5,000; £3,000; £1,000. Further premiums, to a total not exceeding £2,000, may be awarded

at the discretion of the Assessors for other designs of merit.

**Sending in**  
**Day:** 4 September, 1962.

**Last Day for**  
**Questions:** 1 January, 1962.

Conditions may be obtained, upon payment of a deposit of £3, from The Registrar, The University of Liverpool, Liverpool, 3. Quoting Reference RVCH/518/AJ. 9547

## Architectural Appointments Vacant

3s. per line; minimum 12s. Box Number, including forwarding charges 2s. extra

**ARCHITECTS' ASSISTANTS URGENTLY REQUIRED IN BUSY CENTRAL LONDON OFFICE. DETAILING AND WORKING DRAWING EXPERIENCE ESSENTIAL. QUALIFICATIONS AND EXPERIENCE IN DESIGN UNNECESSARY. LONG TERM ENGAGEMENT. FIVE-DAY WEEK. LUNCHEON VOUCHERS. SALARY UP TO £1,250 PER ANNUM. BOX 1157.**

**SENIOR ASSISTANTS** required for work on large hospital programme, excellent opportunities for the right men. Salary £1,000—£1,400. Luncheon vouchers and five-day week. Write giving full particulars: Watkins Gray & Partners, 57, Catherine Place, S.W.1. TC9590

**£950-£1,500. ARCHITECTURAL ASSISTANTS** with imagination and designing ability required to assist with large and important new developments in the central London Area. Telephone or write: Trehearne & Norman, Preston & Partners, 83, Kingsway, W.C.2. HOLborn 4971. TC9798

**WE** have two vacancies in our rapidly expanding and long established practice, for **ASSISTANTS** of Intermediate standard with two or three years' experience. We can offer plenty of scope to the right applicants, and further their present experience both in the office and on the site. Please contact Box TC9731 or Telephone MAYfair 9554.

**EDINBURGH. ARCHITECTURAL ASSISTANTS** required immediately for expanding practice. Please write giving details of age, experience, and salary required to Law and Dunbar Nasmith, 54 Frederick Street, Edinburgh. 89918

**GUILDFORD**  
**THE** services of a further **ASSISTANT ARCHITECT** are required in the Architects Department of Cow & Gate Ltd.

The appointment involves responsibility for all stages of specific projects. Some experience in the industrial field preferred but not essential. Initial salary will be £1,100. Pension Scheme.

Write to Chief Architect, Cow & Gate Ltd., Central Buildings, North Street, Guildford, Surrey, with details of previous professional experience and appointments held. 81215

**EXPERIENCED SENIOR ASSISTANT** required for permanent post in West End branch office of old established firm. Work includes new town commercial development, multi-storey car parking and industrial projects. Successful applicant will have ample responsibility with minimum supervision from Partner-in-charge. Salary will be above average, superannuation and luncheon voucher scheme. Write or 'phone giving brief particulars to Fuller Hall & Foulsham, 212, High Holborn, W.C.1. HOL. 2406. 1216

**WEST RIDING** Architects require **SENIOR** and **INTERMEDIATE ASSISTANTS** for progressive posts in varied practice: experience on Banks and Supermarkets an advantage. State experience and terms to Joseph Berry & Sons, F/A.R.I.B.A., 5, Market Walk, Huddersfield. 1217

**ARCHITECTS** in Watford, London and Glasgow require **ASSISTANTS** of Intermediate/Final R.I.B.A. standard for work on interesting commercial and industrial projects. Salary range: £900—£1,250. Quarterly bonus scheme. Non-contributory pension scheme. Apply Box TC8120.

**ARCHITECTS** with busy practice in Brighton require **ASSISTANTS** with practical experience for varied work. Salary up to £750 per annum. Five-day week, pension scheme, etc. Box TC5848.

**£1,000 / £2,000 p.a.** will be paid to experienced competent **ARCHITECTS** by a private practice in the City of London. The work will be primarily on the drawing board on new and interesting projects of magnitude. A high standard of design and detailing ability is required. Please apply in writing to Box TC9366.

**INTERMEDIATE TO FINAL ASSISTANTS** required immediately. Salary from £1,000 onwards and luncheon vouchers. Theo. H. Birks, 38, Portland Place, London, W.1. LAN 7236. TC9606

**WELLS, HICKMAN & PARTNERS** require first-rate **ASSISTANTS** for varied and interesting work. Salary according to ability and experience. 'Phone: TERminus 1404. 9624



**EDWARD D. MILLS & PARTNERS** require additional staff. Opportunities for keen applicants wishing to take responsibility. Varying work including schools, churches, laboratories, industrial buildings and exhibitions. Write giving full details to 9/11 Richmond Buildings, Dean Street, London, W.1. S9973

**INTERMEDIATE** standard ASSISTANT required in small office for work on variety of jobs. Salary by arrangement. Write Brian Drury, A.R.I.B.A., 34 Selsdon Road, South Croydon. TC9974

**SIR GILES SCOTT, SON & PARTNER** require ARCHITECTURAL ASSISTANT, qualified or unqualified, with practical experience. Interesting and varied practice. Salary up to £1,000 plus luncheon vouchers. Write to 9 Gray's Inn Square, London, W.C.1. S9961

**TOP ASSISTANT** required capable of taking complete control of contracts. Salary according to ability.

Dalling and Partners, Chartered Architects, 14, Bloomsbury Square, London, W.C.1. Telephone: CHAncery 4725 or write. TC1040

**NORMAN & DAWBARN**, who have moved their London Office to new premises south of the river, require ASSISTANT ARCHITECTS within the salary range £1,200-£1,500 on a variety of projects. Large progressive office offering outstanding opportunities for people of ability, both at home and overseas. Excellent working conditions, hours 9.15 to 5.30, lunch vouchers, three weeks annual leave. Write or phone Norman & Dawbarn, Architects and Consulting Engineers, 234-244, Stockwell Road, London, S.W.9. REDpos 3131. TC1013

# OFFICE OF PATRICK GWINNE

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The Homewood, Esher, Surrey. S9989

**ARCHITECTS** in Private Practice in the Home Counties will pay £1,000 to £1,500 per annum to competent ARCHITECTURAL ASSISTANTS. Varied and interesting work in hand. Write stating age, experience and salary required to Box S1020.

**THE** following vacancies occur in Reading and Bristol for:-

(1) SENIOR ASSISTANT ARCHITECTS, £1,200-£1,400.

Applicants must be qualified and have had post graduate experience, or have had ten years' experience.

(2) ARCHITECTURAL ASSISTANTS, £750-£1,200. Applicants should have had several years' experience in an Architect's office and be capable of producing working drawings and details with the minimum of supervision.

Salaries progressive on merit; permanent pensionable positions. Applications stating full details of qualifications, experience, age, etc., should be forwarded to the Senior Architect. Box S1072.

## WOLVERHAMPTON

**SENIOR AND JUNIOR ASSISTANTS** with enthusiasm and a keen sense of responsibility required in busy progressive office with a wide programme of work.

Write or telephone for an interview to: Diamond, Redfern and Partners, 26a, Snow Hill, Wolverhampton. Telephone: 27621 Wolverhampton. S1067

**RIGHT-HAND MAN** required for general practice, hospital, housing, television work, also competent junior. Farms & Partners, F./R.I.B.A., 24 Welbeck Way, W.1. WE1 6543. S1075

**EXPERIENCED ASSISTANTS**, Intermediate to Final standard, required for a wide variety of work including large scale multi-storey schemes. Five-day week. Study time allowed for part-time day or evening students. Colcott & Ham, 86 Prince Albert Road, Regents Park, N.W.8. Primrose 5157. S1080

**ARE you browned-off in London?** Wanted urgently—ARCHITECTURAL ASSISTANTS with experience and ability in modern design for interesting Northern Practice. Knowledge of Schools Design an asset. Intermediate standard or fully qualified or (with experience) not qualified at all. Salaries up to £1,500. Pension Scheme. Also JUNIOR QUANTITY SURVEYORS required. Write: Langtry-Langton, 8 Oak Mount, Bradford, 8, Yorkshire. S1095

**ASSISTANT ARCHITECT** required with not less than three years' office experience and not over 30 years of age for well known and old established practice. Please give details of education and experience in replying. Box S1081.

**SCHOOL TRAINED QUALIFIED ASSISTANT** required by London Architect to work on research and erection of a series of multi-storey car parks and offices. Salary by arrangement. Write Box S1088.

**SUTTON, SURREY. SENIOR ARCHITECTURAL ASSISTANT** urgently required for interesting residential and commercial practice. Salary commensurate with speed, application and initiative. Thompson & Gardner, 6, Grove Road, Sutton, Surrey. Tel. Vigilant 4436. S1089

**TRURO.** Small expanding office, with comfortable and modern accommodation, requires qualified ARCHITECT with a sense of urgency. The Architect will be required to take complete control of jobs from clients' instructions to final accounts after a trial period. A high standard of ability in design, draughtsmanship, building construction and specification writing is essential. Salary according to ability. Full particulars to Box S1092.

**ARCHITECTURAL ASSISTANT** required by Brewery Company in London. A.R.I.B.A. or about to qualify. Pension, Cost of Living and Bonus schemes, etc. Tel: KNI 8321 Ext. 13, or in writing to Box S1107.

**GLOUCESTER PLACE** Office of young enthusiastic partnership requires ASSISTANTS to take responsibility for wide variety of modern work. Write with complete details to Box S1112.

**CHELMSFORD, ESSEX.** Experienced ASSISTANT, Intermediate/Final standard, required for an office offering the variety of work found in a provincial practice. Good opportunity for one willing to accept responsibility. Apply with details and salary required to A. E. Wiseman, Chartered Architects, 10, Duke Street, Chelmsford. S1117

**ARCHITECTS' ASSISTANTS** required in Central Birmingham Office to work on a variety of interesting projects. Salary according to experience and ability £750 to £1,000. Five-day week. Central 6139 or Box S1118.

**WELL ESTABLISHED** North London office require Senior and Intermediate ARCHITECTURAL ASSISTANT. The situations are of particular interest to men who want interesting work without the tedium and expense of daily travel to Town. Projects in hand include Hospital, Industrial, Bank, Domestic and Commercial schemes in London and the Home Counties. Five-day week. Three weeks annual leave. Write giving full details of training, experience and salary required to: E. William Palmer & Partners, Chartered Architects, 8 The Town, Enfield, Middlesex. S1137

**BRIGHTON & HOVE.** Senior and Intermediate standard ASSISTANTS required for work along South Coast. Salaries up to £1,200 per annum. Five-day week. Three weeks annual holiday. Superannuation and Free Life Insurance. H. Hubbard Ford & Associates, F./A.R.I.B.A., 67 Church Road, Hove 3. S1127

**NORTH & PARTNERS**, Chartered Architects, have vacancies for an Intermediate Grade and Senior ASSISTANT for interesting and varied works. Five-day week. Pension Scheme, etc. Applications to 40 Broadway, Maidenhead. S1129

**HENING & CHITTY** require ASSISTANT ARCHITECT to design and supervise new college work. Particulars to 30, Percy Street, London, W.1. S1133

**STREATHAM** Architects require Senior and Intermediate ASSISTANTS. Modern offices, interesting work with ample responsibility. Please ring Tulsa Hill 0077. S1139

**URGENTLY** required by busy City Office, experienced ASSISTANT. Every opportunity for initiative and responsibility. Varied and interesting practice. Five-day week; Luncheon Vouchers. Good salary commensurate with experience. Kenneth Lindy & Partners, 24, St. Mary Axe, E.C.3. Avenue 6153. S1160

**ERIC LYONS** has place for experienced ASSISTANT ARCHITECT who wants responsibility and opportunities. Brief particulars to: Mill House, Bridge Road, Hampton Court, Surrey. TC9542

**BIRMINGHAM.**—We need a young ARCHITECT, either qualified or in training, with a good sense for clean and straightforward design. There is plenty of scope for the right man. Salary according to ability and experience. Apply: J. Alfreid Harper & Son, 65, Temple Row, Birmingham. S1189

**OLD BOSHAM.**—ASSISTANT, Intermediate to Final standard, for small but expanding and progressive practice located in well-known sailing village. Interesting work at home and abroad. Salary by arrangement. Peter Harrison, Church Meadow, Old Bosham, Sussex. Bosham 3383. S1190

**SCHWEPPE'S ARCHITECTS' DEPARTMENT** REQUIRE ASSISTANTS DRAUGHTSMEN FOR COMPANY DEVELOPMENT PROGRAMME. VARYING WORK THROUGHOUT GREAT BRITAIN. APPLICANTS TO WRITE IN FIRST INSTANCE TO PERSONNEL MANAGER, 1-6, CONNAUGHT PLACE, LONDON, W.2. STATING FULL PARTICULARS. AGE, EXPERIENCE AND SALARY REQUIRED. 1195

**TALENTED** young EX-STUDENT wanted to work with West End planning consultant on important London urban redevelopment scheme. Good sketching and modern architectural design essential. Particulars to Box S1198.

**INTERMEDIATE** to FINAL ASSISTANT required. Town and country practice in South West. Salary up to £1,000 according to experience. Reply Box 1201.

**ASSISTANT ARCHITECT** (Intermediate standard) required by large Multiple Retail Organisation in West Midlands with interesting programme of work. Experience in shop design, major alterations, factory and domestic work desirable. Details and salary required to Box 1203.

**UNIQUE OPPORTUNITY** for Intermediate-Final ASSISTANT to train directly under Principal in small office. Good salary. WELbeck 4805. 1206

**ARCHITECTS** require ASSISTANTS, Senior and Junior, and SHOPFITTING DESIGNER/DRAUGHTSMEN for extensive Multiple Shop Development programme. Top commencing salaries according to experience with guaranteed annual increments offered. Five-day week. Interview expenses covered. Stephenson, Gillis & Partners, 2, Saville Chambers, North Street, Newcastle on Tyne. S1209

## PROWING ESTATES LTD.

require ARCHITECTURAL ASSISTANTS

of Intermediate grade or above. Good salary, pension and bonus schemes. Apply in writing, stating age, experience and salary required, to Prowing Estates Ltd., Ruislip, Middx. S1210

**DOWTON & HURST** require ARCHITECTURAL ASSISTANTS. Intermediate standard with at least five years' office experience, or Final standard and at least three years' office experience. Present work includes: Hospitals, Schools and Commercial buildings. Salary according to experience. Bonus and luncheon vouchers 10, Portman Street, Portman Square, W.1. HYD. 1822. S1213

**A PROGRESSIVE** West End architectural practice requires a fully qualified ARCHITECT with experience of negotiation of Awards and site and service surveys, with positive interest in technical, constructional and legal aspects of an architectural practice. The applicant will be expected to administer and develop a section nucleus which already exists.

Salary commensurate with age, keenness and experience. Commencement date can be discussed at interview. Please reply in writing, giving full details of age and experience, to Box S1214.

**OSCAR GARRY & PARTNERS** require ASSISTANTS of both Intermediate and Final standard, with at least two years' office experience in this country, to work on interesting projects in early design and contract stages. Five-day week, luncheon vouchers. Salary by arrangement, according to qualifications and experience. Phone WE1 2507 or write 66, Gloucester Place, London, W.1. TC9521

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**£850-£1,600. ARCHITECTURAL ASSISTANTS** required. Long term prospects. Non-contributory pension and life assurance schemes. Five-day week. Telephone or write: Ronald Ward & Partners, 29, Chesham Place, Belgrave Square, S.W.1. Belgravia 3361. TC6165

**ARCHITECTURAL ASSISTANTS** of all grades, particularly intermediate standard, required on varied and interesting projects. High salaries will be paid in accordance with skill or experience of applicant. Lewis Solomon, Kaye & Partners. City 8811. TC9379

**CLIFFORD CULPIN AND PARTNERS** need additional staff in their London and Hemel Hempstead offices. Men of about intermediate standard particularly required to join small teams of keen men on important, varied projects. All must have a sound sense of modern design. 39, Doughty Street, London, W.C.1. CHANCERY 5395. TC9379

**SENIOR AND JUNIOR ASSISTANT ARCHITECTS** required with progressive outlook, for work on a wide range of projects. Starting salaries up to £900 for intermediate standard and up to £1,250 for Final standard, according to experience. Five-day week. Box TC9219.

**ELIE MAYORCAS** requires **ARCHITECTURAL ASSISTANTS** with a minimum of three years' office experience in this country. Write, giving brief particulars of architectural education and experience, to: 13, David Mews, Baker Street, W.1. TC9442

**EXPERIENCED ASSISTANT ARCHITECT** required in West End office. Varied work, must be a competent designer and administrator. Opportunity for advancement to position of responsibility. Starting salary up to £1,250 according to experience. Luncheon vouchers. Five-day week. Box TC9218.

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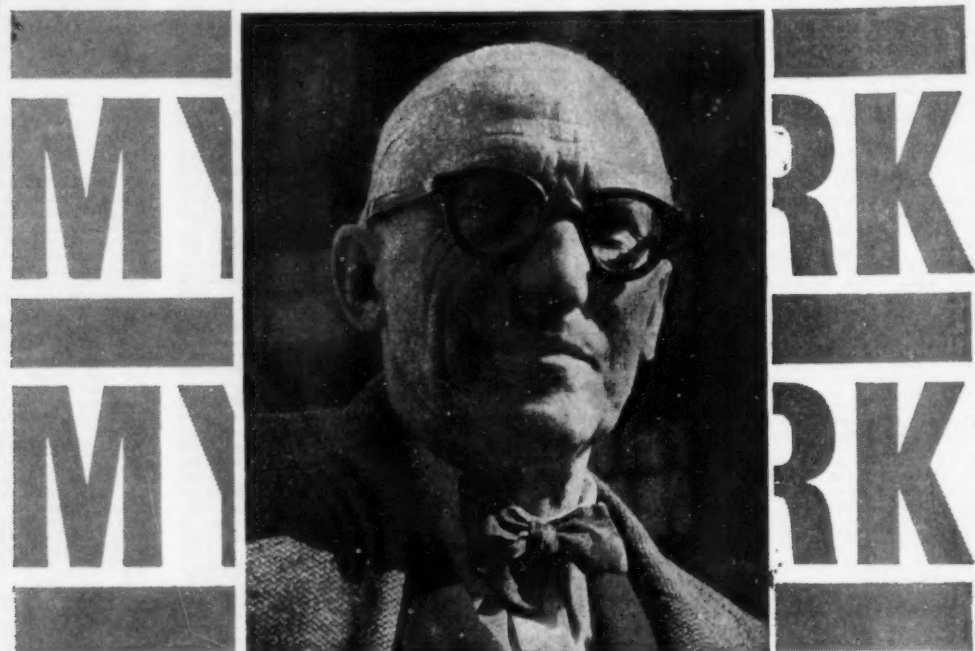
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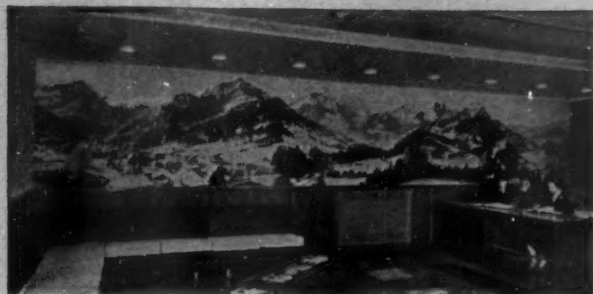
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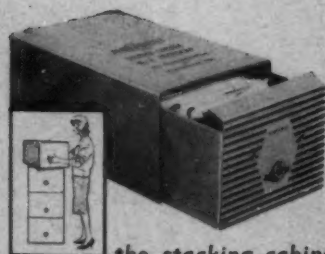
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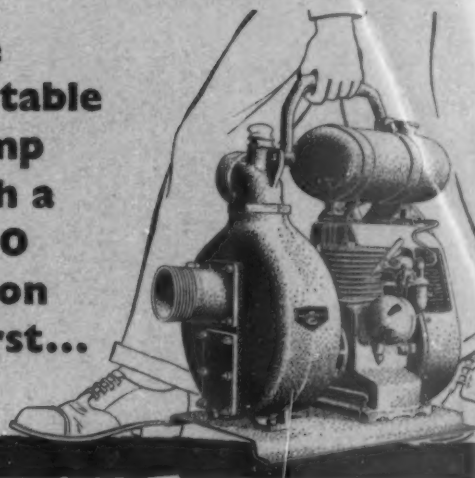
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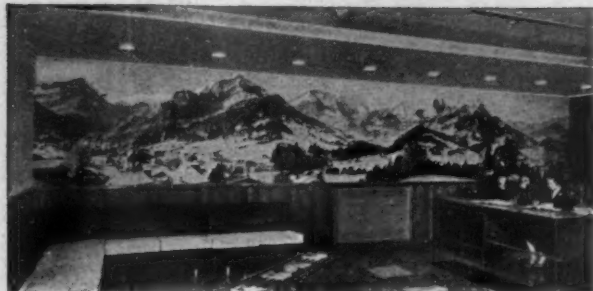
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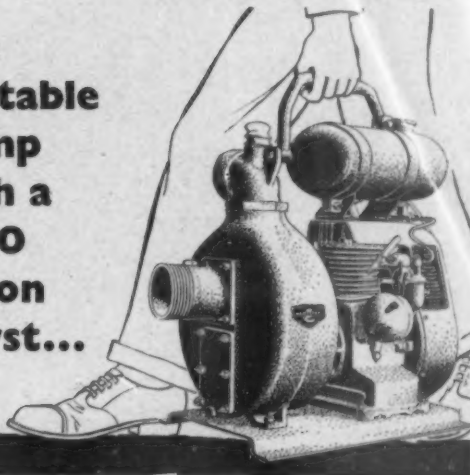
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